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**SISPyR**

**Sistema de Información Sísmica del Pirineo**  
**Système d'Information Sismique des Pyrénées**  
**Sistema d'Informació Sísmica dels Pirineus**

**Shake map automatic process**  
**Action 4.1**



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## Synopsis

The aim of action A4.1 from SISPyr project is to provide automatic shake maps at different time intervals, defined by user, after an event is detected; based on ShakeMap system from United States Geological Survey (USGS) (<http://earthquake.usgs.gov/earthquakes/shakemap/> ).

The aim of this document is to summarize the requirements of the process that have to allow having this automatic generated maps, one of them in Near Real Time (NRT).

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# 1. Requirements

## 1.1. Overview

The aim of action A4.1 from SISPyr project is to provide automatic shake maps at different time intervals, defined by user, after an event is detected; based on ShakeMap system from United States Geological Survey (USGS) (<http://earthquake.usgs.gov/earthquakes/shakemap/> ).

The aim of this document is to summarize the requirements of the process that have to allow having this automatic generated maps, one of them in Near Real Time (NRT).

General requirements of the process are:

- Shake maps will be automatically generated for a user defined region and magnitude threshold.
- The process have to be programmed in a modular way, thinking about the possibility of integrate part of the process to other modular processes.
- Some of the parameters have to be configurable (not all hardcoded).
- A log file has to be generated detailing the processes done and the results of each of them.

## 1.2. General considerations

### 1.2.1. Used terms

To clarify and avoid misunderstanding some terms are defined:

- *Ftp*: refers to the home folder used by the system to exchange input and output files, i.e. macroseismic data, results of computations, etc. Ftp site will be organized in, at least, 2 main folders: *<input>* and *<data>*.

The *<input>* subfolder will contain the alert XML files, written there by any Datacenter, named \*.xml.

- Date and time code will be used with the format *[yyyy][mm][dd][hh][MM]*, where:
  - *[yyyy]* will be the year of the origin time of the event's location,
  - *[mm]* will be the month of the year of the origin time of the event's location,
  - *[dd]* will be the day of the month of the origin time of the event's location,
  - *[hh]* will be the hour of the origin time of the event's location, and

- *[MM]* will be the minute of the origin time of the event's location.
- “*waveform*”, “*waveform data*”: are referring to seismic and accelerometric waveforms obtained from seismic and accelerometric stations involved in SISPyr project,
- “*repository*”, “*storage*”, “*archive*”: all refer to a centralized facility where seismic and accelerometric waveform data obtained from seismic and accelerometric stations, along with station metadata, which comprises station coordinates, sample rate, height, etc., are stored under a certain conditions determined by the requirements exposed in this document,
- “*data centre*”: refers to all the SISPyr Seismic Data Reception Centers: IGN, BRGM, OMP, and IGC,
- “*module*”: is used discretionally when referring to module or sub-module, for the sake of simplicity,
- “*wildcard*”: refers to characters in a string that can be substituted for any other character or characters. In this module only two wildcards will be used. The question mark (“?”) can be substituted for any other character, while the asterisk (“\*”) can be substituted for zero or more characters.

### 1.2.2. Measuring units and formatting

This section defines which units will be used when dealing with measurable terms that appear through the document.

- Unit for time measurement will be seconds with a decimal resolution up to milliseconds unless otherwise specified. Items such as time intervals fall into this category.
- Dates will be displayed in *dd/mm/yyyy* format, and stored in seconds passed since midnight from 01/01/1970, with decimal a resolution up to milliseconds, where:
  - *[dd]* will be the day of the month,
  - *[mm]* will be the month of the year, and
  - *[yyyy]* will be the year.
- Any geographical coordinate reference will be dealt in sexagesimals degrees for latitude and longitude, either in display or storage, with a precision of 4 decimals. Positive values will be considered for East longitudes and North latitudes.

In the case that some input data will have less than 4 decimals, the system will complete its value adding zeros at the right side after the decimal point until complete the four required decimals.

- Distances will be measured in kilometers, with decimal resolution up to meters, including depth of hypocenters.

In the case that some input distance data will have less than 3 decimals, the system will complete its value adding zeros at the right side after the decimal point, until complete the 3 required decimals.

- The computed parameters will be in the ShakeMap v3.5 units for parameters (i.e. units of %g for PGA and PSA, cm/s for PGV) and EMS-98 scale for Intensity.
- Channels will be fully identified by their SCNL code in N.S.C.L format, where N stands for network code using up to 8 characters, S for station using up to 6 characters, C for component using up to 3 characters, and L for location using up to 2 characters.

In this format, an undefined location will take the value '\0', which means "nothing", i.e. the SCNL code of channel "HHN" of one station from "FR" network, named "PYTU", and without location code, will be "FR.PYLU..HHZ".

Additional support for SCN code will be implemented to preserve backward compatibility, using the same format specification as in SCNL.

### **1.3. *System description***

The purpose of the system planned at this document, is to automatically produce shake maps after it receives an alert message generated by a third party system. The system must be able to handle multiple shake map generations, although, they will be computed one at a time.

System definition will consider to keep some parameters configurable by the user, as for example the time-table of producing shake map versions of an event, scheduling them referring event origin time.

In order to grasp a better understanding of the process, it's necessary to break down the whole into smaller self-contained sub-modules. These are the proposed modules:

- Trigger module: an alert message is received at the ftp site and it triggers the process. The following steps will be done at n different user defined times (t0 (NRT), t1... and tn).
- DARACOM (DAta Retrieval And COMputation) module: this module will read waveforms from the NRT Server and will process them to compute PG and SA parameters.
- Export module: export parametric data generated by the computation module to the system where ShakeMap 3.5 system is hosted.
- Import module: import parametric data from system where they are computed.
- ShakeMap Manager: prepare input data (data received by the import module plus data other input from the ftp site) according to ShakeMap system requirements and launch the shake map generation.
- ShakeMap: computes shake map, according input parameters and settings and send the results to the ftp site.

The first four modules will run under Windows 32 bits and the last three, according ShakeMap 3.5 requirements, will run under Linux 32 bits. The MS Windows part of the Shake map automatic process, 2013.04.26

system will be developed under Visual C++ and the Linux part under C++. A schematic diagram of these modules and their interconnection is shown in Figure 1;~~Error! No se encuentra el origen de la referencia..~~

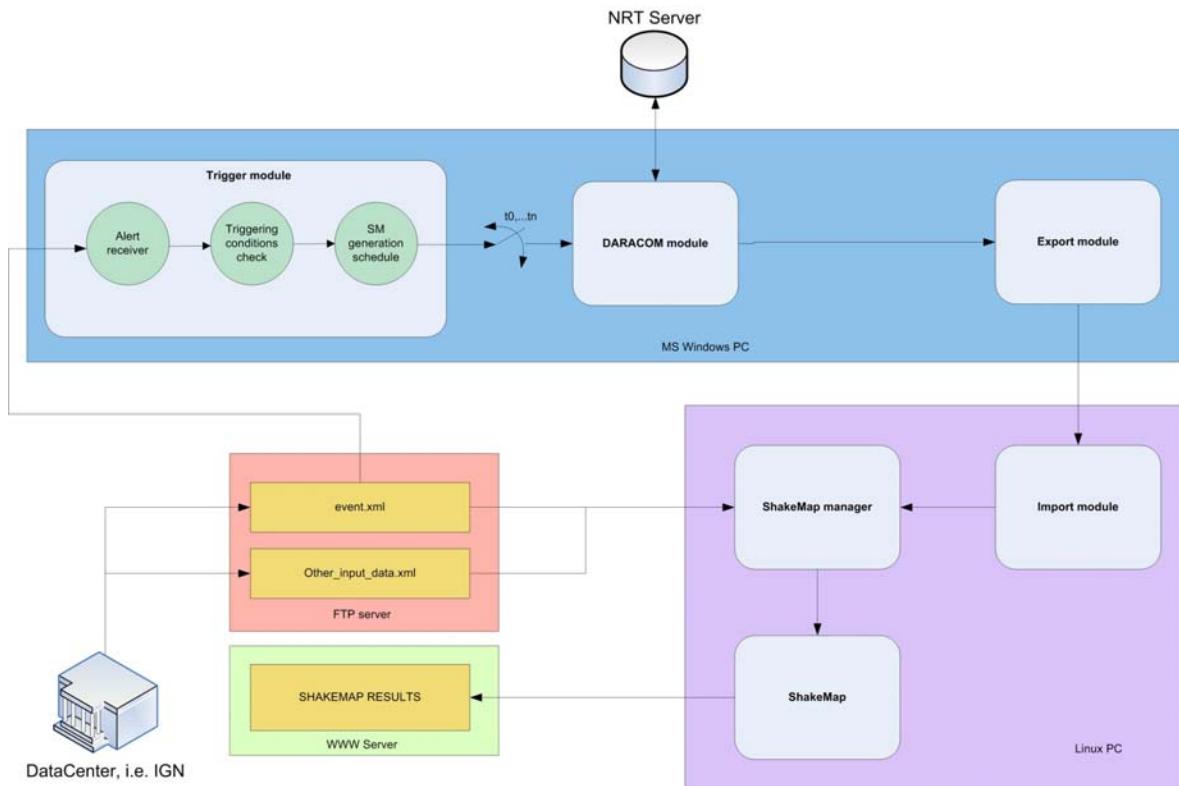


Figure 1 - Blocs schema of the automatic shake map system diagram

All these modules can be divided in two groups, depending if they run on the MS Windows PC or on the Linux PC.

All modules of each group will be started, monitored, restarted and/or stopped by a “Watchdog” module. This module also will have a configuration file where log folder, individual modules path and their configuration files, as well as other general information will be set.

Modifying configuration will imply restarting modules for changes to take effect.

### 1.3.1. Trigger module

Trigger module will be the first actor of the processing chain. This module will run under MS Windows 32 bits (XP SP2 or later) in console mode.

In a first step, this module will check a specific folder on the ftp site every *tc* minutes, according with system configuration<sup>1</sup>, in order to detect any new \*.xml input file at <input> folder.

<sup>1</sup> See Appendix 2 for details

At the moment when the module detects any new input XML file, the module will apply the following procedure:

- Validate content of \*.xml<sup>2</sup>.
- Decide if the new XML input file corresponds to a new event or to a previous event which has been relocated. So, to do that the system will check if any subfolder exists under <data> ftp folder being named *yyyymmddhhMM±1*<sup>3</sup>, where *yyyymmddhhMM* corresponds to origin date and time of event location as appear inside the XML file.
- Create a subfolder in ftp <data> folder name as the XML input file (of course, without considering the .xml extension). If subfolder exists, with a name *yyyymmddhhMM±1*, this step will be skipped.
- Move the new input file inside the subfolder and rename it as event.xml. If this subfolder contains a previous event.xml file, it will be overwritten.
- In case of the input file corresponds to a new event, the system will assign a new unique Event\_ID, or in case that it corresponds to a relocated event, the system will find the corresponding previously assigned Event\_ID; and in any case, the Event\_ID will be written at the id tag inside the event.xml file.
- Additionally, if it's a new event, a file with extension ".id" and name corresponding to the assigned Event ID will be created in the aforementioned subfolder.

Once the content of input XML file is validated, it will check triggering conditions configured by user, considering regions and magnitude thresholds. In case of relocated events, data from the new XML file will update the ancient one.

The module will support that many triggering conditions are declared, but they will be checked in the same order that they appear at the configuration file, and once one of them success the following ones will not be taken into account.

If triggering conditions are not accomplished and it's a new event, the system will discard the alert message. Otherwise the module will schedule the generation of shake maps according to the user settings.

There's an exception, though. In case it's a relocated event which doesn't fit any of the trigger conditions after to be relocated, all scheduled shake maps for this event will be cancelled, and the event will be set for purge. Figure 2 summarizes the main functional processes of the trigger module.

The shake map generation scheduler will take into account the following considerations:

- Time delay of configuration file will be referred to the origin time of the event.
- In case that, when system checks triggering conditions, it finds that the time to produce one or more shake maps of a given event is in the past (i.e. because the

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<sup>2</sup> See 0 for details

<sup>3</sup> See section **iError! No se encuentra el origen de la referencia.**

alert message has arrived with a large delay), it will start immediately producing an unique shake map which will correspond to all past triggers of the same event.

- When the module starts, it will check the list of pending shake maps (this list will be maintained and saved in local file system, periodically, by this module) in order to detect any map generation behind the schedule and in this case it will be processed immediately.

The shake map generation chain starts with this module, and it will be in charge of send a message to DARACOM and Shakemap Manager with required information to be able to continue the map generation process.

Also, the module will purge the <data> ftp folder each *tpurge* hours, moving all completely processed events from the <data> folder to <old> folder at the same ftp site.

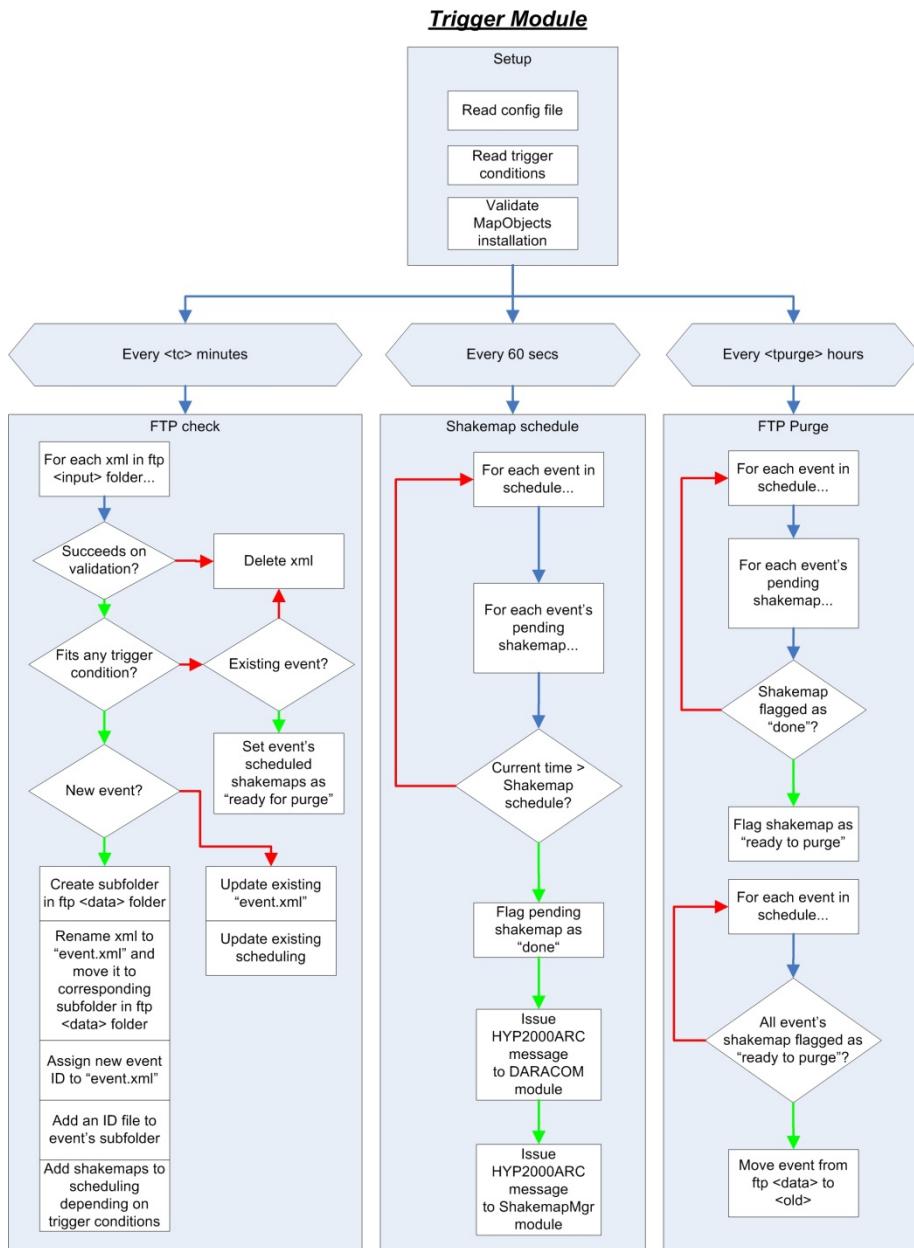
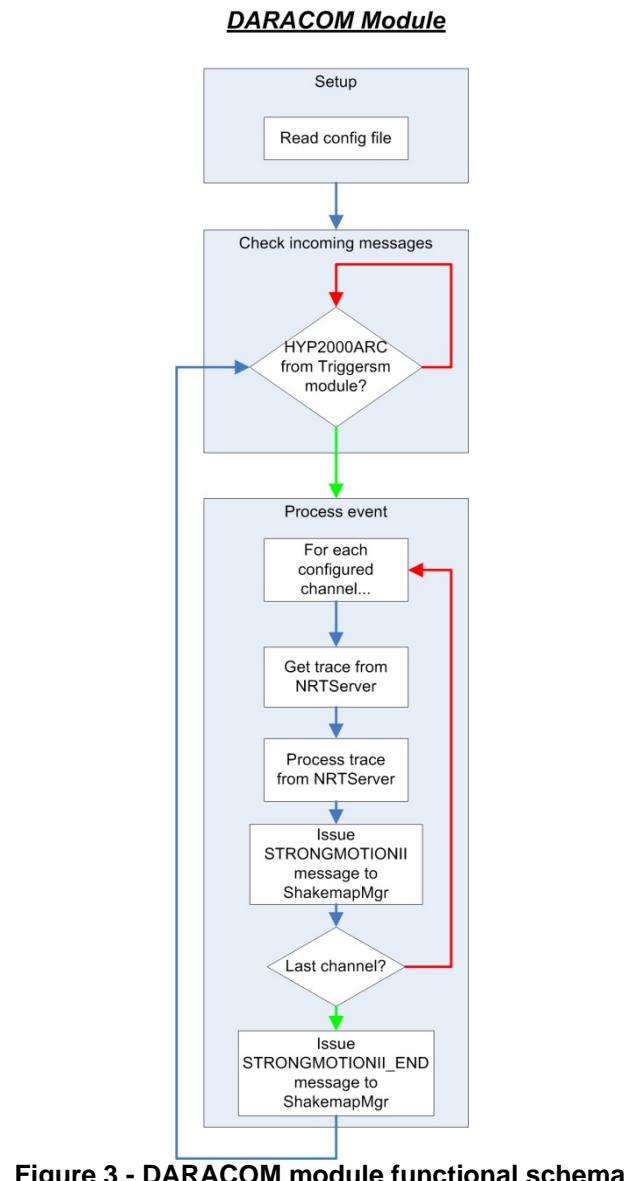


Figure 2 - Trigger module functional schema

### 1.3.2. DARACOM module

This module, from a functional point of view, will be divided into two parts: a waveforms input sub-module and a PG&SA computation sub-module. For each SCNL it processes, a message will sent to Shakemap Manager, and, once it will finish processing all SCNL's, a "finished event processing" message will be sent.



- Waveform input sub-module

The waveforms input sub-module will be in charge of retrieve waveforms from the configured NRT Server (Artero, 2010) according user settings.

The module will allow defining the *traceTimes* time intervals, considering the P&S waves velocity model provided in the configuration file, to retrieve data from the NRT server. These time intervals will be referred to the theoretical arrival time of P-waves for the pre-event time, and to theoretical arrival time of S-waves for the post-event time, at each station. Other options will be available, see Appendix 3;**Error! No se encuentra el origen de la referencia.** for details.

Also, the configuration file will provide configurable parameters to decide which stations and/or channels will be considered by the waveform's data retrieval process, depending of the event's magnitude.

Once all desired waveform data are retrieved, they will be sent to the PG&SA computation sub-module, to be processed, together with hypocenter and magnitude data.

- PG&SA computation sub-module

This sub-module will compute ground-motion parameters: peak ground acceleration and velocity, plus 3 spectral response values from waveforms traces retrieved from the NRT Server.

This sub-module will prepare the data for processing by checking for gaps and removing the mean. Then it will transform the trace data into the frequency domain using an FFT (fast Fourier transform). A cosine taper will be applied to remove the lowest and highest frequency components. The default values for the cosine taper ranges will be 0.05 to 0.1 Hz at the low end and 45% to 50% of sample rate at the high end. Individual SCNLs may be configured to use other filter values if necessary.

The instrument response will be removed, and acceleration and velocity traces will be computed in frequency domain. In addition, spectra response data will be computed for the configured three periods, with 5% damping. All these traces will be computed in the frequency domain, since integration or differentiation are easily computed there.

The spectral response traces will be computed by generating the response function for a one degree of freedom harmonic oscillator with the specified free period and damping. All these synthetic traces will be then transformed back to the time domain by an FFT that handles multiple arrays simultaneously.

When the synthetic traces have been returned to the time domain, the peak amplitudes will be located for each trace. The search for peak amplitude will be done within a time window related to the estimated S-phase arrival time and specified in the configuration file.

This module will write a message for each SCNL that it will process. This message will contain the PGs and 3 spectral response values for the SCNL. Once all SCNLs are processed, results will be sent to the next module of processing chain, the *export module*, together with the event's localization coordinates, origin time and magnitude.

The name of each psa parameter will be the result (without decimals) of multiplying by ten the time period at which it has been computed; and preceded by "psa". For example, if the psa has been computed for a period of 1.2 seconds, the name of the parameter will be "psa12".



### 1.3.3. Export module

*Export* module will be in charge of receiving results of *Triggersm* and *DARACOM* modules and sends them to the Linux machine over a network. This module will be the last one of the first stage of the processing chain.

This module will send data to the *import module* running on to the linux machine. Some protocol will be implementing to monitoring the connection between both modules and, in case of failure, to restore it.

### 1.3.4. Import module

This module will receive all data provided by the *export* module, and it will be the first link of the second stage of the processing chain, which will run under Linux OS.

This module will receive data from the *export* module running on to the MS Windows machine. Some protocol will be implementing to monitoring the connection between both modules and, in case of failure, to restore it.

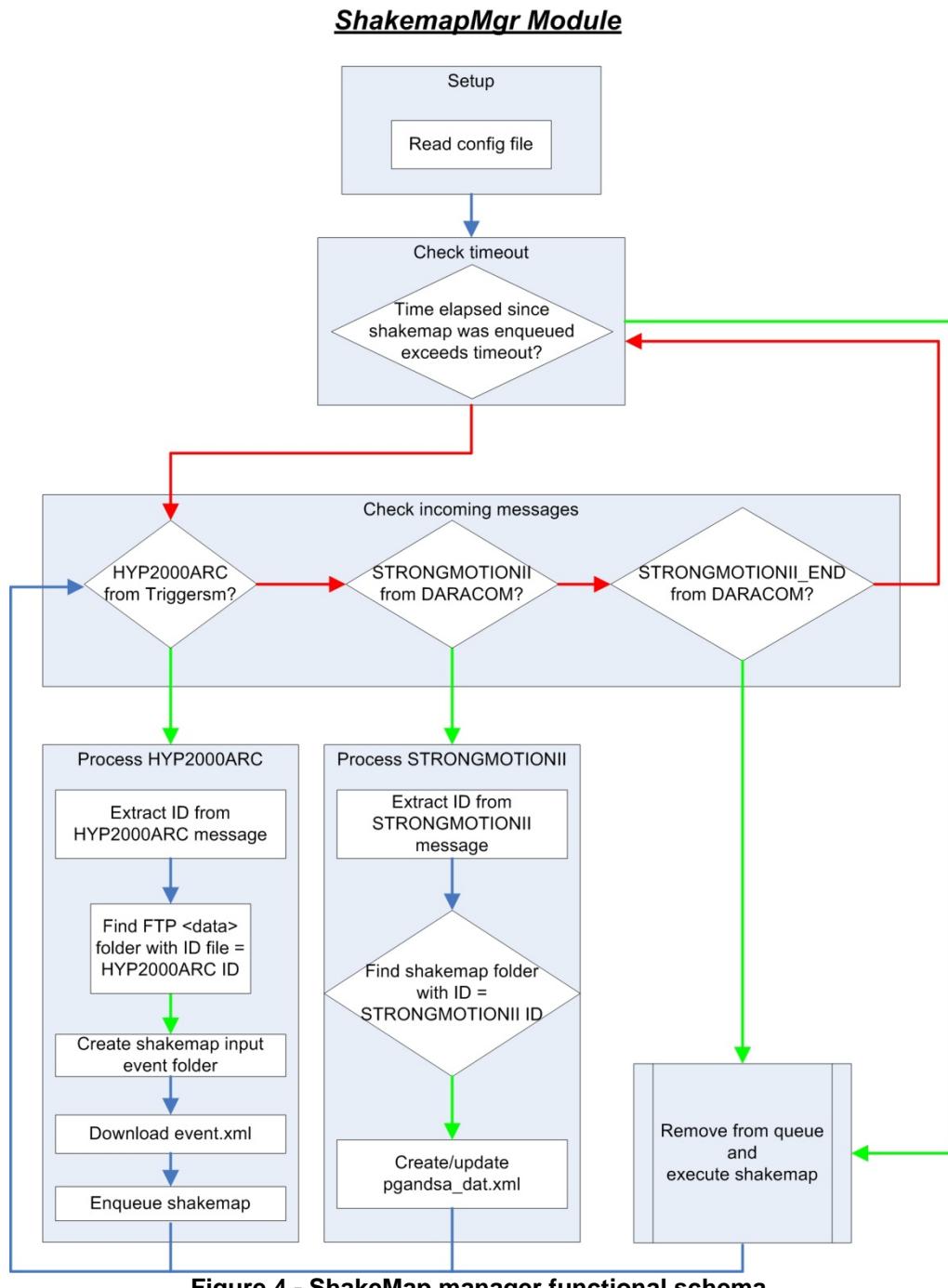
Once data will be received from the *export module*, they will be sent to the *ShakeMap manager* module.

### 1.3.5. ShakeMap manager

*ShakeMap manager* will prepare, parse and organize input data required to produce the shake maps, before to start the ShakeMap system. So, when a “finished event processing” message will be received or when the configured timeout will be exceeded.

Actions of this module will be:

- The system will retrieve the corresponding event.xml file from the ftp site as well as any other \*\_dat.xml, \*\_sd.grd, \*\_estimates.grd and \*\_fault.txt file from the ftp subfolder which contains the event.xml file that id = event\_ID.
- It will check if any folder exists named <\$shake\_home\$/data/event\_ID> and if it does not exist, it will create. From now on it will be referred as <event\_ID> folder.
- It will copy all files retrieved from the ftp, to the folder <\$shake\_home\$/data/event\_ID/input>, overwritten existing ones if needed.
- It will generate a new XML file, named pgandsa\_dat.xml, with the parameters computer by the PG&SA sub-module and received through the import module. The content and format of this pgandsa\_dat.xml file is specified at Appendix 10.
- The name of each psa parameter will be the result (without decimals) of multiplying by ten the time period at which it has been computed; and preceded by “psa”. For example, if the psa has been computed for a period of 1.2 seconds, the name of the parameter will be “psa12”.
- It will launch the ShakeMap module with the event\_ID as an input parameter.



This module will queue different shake map generations requests and it will organize them in time, guaranteeing that the ShakeMap module has finished one process before to start a new one.

### 1.3.6. ShakeMap

ShakeMap module is more than one module; it will be a regionalized installation of the USGS ShakeMap 3.5 system, and the regionalization and customization of this module are not in the scope of this document.

This module will be in charge of computing the shake maps, taking as input data all files from the <\$shake\_home\$/data/event\_ID/input> folder; generating results and uploading them to the configured ftp site.

### 1.3.7. Miscellaneous

As said before, the system has 2 parts clearly differentiated. The first part will run under MS Windows, and its main purpose is that, in case of event, prepare for shake map generations and their scheduling.

The second part will run under Linux, and it corresponds, basically, to the shake maps generation.

Each of these parts of the system will must run with the maximum stability and reliability; but in case that some of the modules has some problem and stops, some system has to be implemented in order to detect it and restart the module.

All actions and errors of all modules must be properly reported on their corresponding log files.

## 2. Configuration

Once system has been developed accomplishing requirements described at section 1, it has been configured. System settings have been optimized for the SISPyr region and regional systems characteristics.

### 2.1. *Trigger*

Trigger configuration is stored in 2 different files: trigger.d and \*.xml configuration file. Main configuration parameters will be set in the first file, including the name of the second configuration file, which will contain the operational specific settings for the region.

#### 2.1.1. “trigger.d”

As said, this configuration file will contain main configuration parameters of Trigger module. These parameters and their values are shown in Table 1.

Parameter	Value	Comments
MyModuleId	MOD_TRIGGERSM	Module id for this instance of template
RingName	MAIN_RING	Shared memory ring for input/output
LogFile	1	0 to turn off disk log file; 1 to turn it on
HeartBeatInterval	15	Seconds between heartbeats
XMLConfig	triggersm.xml	XML configuration file

Table 1 - Trigger configuration parameters

#### 2.1.2. “triggersm.xml”

This file will contain in XML like format the specific operational parameters for a given region and instance of Trigger module. These parameters made reference to three different aspects:

FTP server site where input parameters are allocated and its management.

Triggering conditions to schedule the shake maps generation.

Schedule of shake maps generation

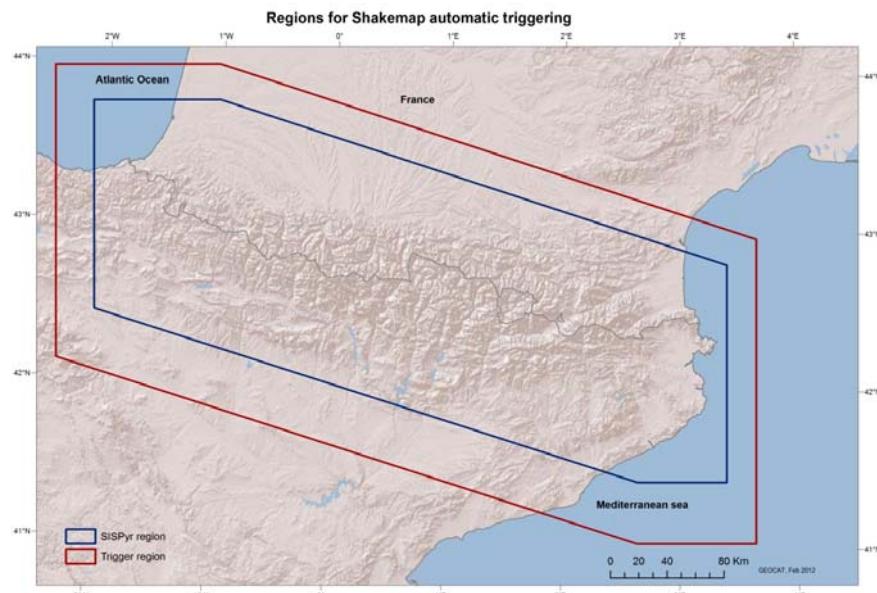
For this file, configuration shown on Table 2 is proposed, where just one trigger is defined considering the region of the configured shapefile, magnitudes between 3.0 and 10.0, and 5 shake maps generation with delays of 5, 30, 60, 180 and 360 minutes.

FTP		
Parameter	Value	Comments
host	ftp.igc.cat	IP address of FTP server, or FQDN
port	21	Port of the FTP server
username	macroispyr	Username with WR access to FTP server
password	*****	Password corresponding to above username
tc	1	Minutes between FTP server checks

tpurge	240	Hours between FTP purges
initialpurge	01:00	Hour of first FTP purge after startup
shakeonrelocate	1	0 to turn off; 1 to turn it on
<b>TRIGGER</b>		
Parameter	VALUE	COMMENTS
name	zone1	Trigger ID
latmin	40.0000	Minimum latitude
latmax	44.0000	Maximum latitude
longmin	-3.0000	Minimum longitude
longmax	4.0000	Maximum longitude
depthmin	0.000	Minimum depth in km
depthmax	100.000	Maximum depth in km
shape	sispyr_trigger.shp	Shapefile which contains the contour of trigger region
<b>SHAKEs</b>		
Parameter	VALUE	COMMENTS
name	shake1	Shake ID
delay	5	Delay, in minutes, of above shake ID
name	shake2	Shake ID
delay	30	Delay, in minutes, of above shake ID
name	shake3	Shake ID
delay	60	Delay, in minutes, of above shake ID
name	shake4	Shake ID
delay	180	Delay, in minutes, of above shake ID
name	shake5	Shake ID
delay	360	Delay, in minutes, of above shake ID

**Table 2 - XML Trigger configuration parameters**

So, according with parameters of Table 2 this module will check to FTP server each minute, and for each event which epicenter will be inside the region defined by configured shape file (see Figure 5) with depth between 0 and 100 km and magnitude between 3.0 and 10.0, it will schedule 5 shake maps generation with delays of 5, 30, 60, 180 and 360 minutes.

**Figure 5 - Trigger and SiSPyr regions**

## 2.2. DARACOM

DARACOM configuration parameters are stored in *daramcom.d* file, including additional configuration files pointers. These parameters and setting are shown on Table 3;~~Error!~~  
**No se encuentra el origen de la referencia..**

### 2.2.1. "daramcom.d"

PARAMETER	VALUE	COMMENTS
RingInName	MAIN_RING	Input transport ring from which to read messages from Trigger
RingOutName	MAIN_RING	Output ring
MyModId	MOD_DARACOM	Module ID
HeartBeatInterval	30	Seconds between heartbeats
getEventsFrom	INST_WILCARD MOD_TRIGGERSM	InstID and ModID from which to read event data
maxSta	300	Maximum number of SNs to be used
maxDist	300	Maximum epicentral distance, in km
maxTrace	120000	Maximum number of samples per SCNL
staLoc	NRTServer	Source of station locations
@model	@model.d	Local velocity model
traceSource	NRTServer 84.88.80.25:25000	Waveform data source
respSource	File C:\EW\v7.4\params\SACdir DAS_PZs_%N%_S%C.rsp	Tells DARACOM where to get response information
traceTimes	15.0 60.0	Relative start and end times for traces
searchWindow	0.0 4.0 0.0 15.0	Time window for searching for peak amplitudes
saveTrace	D:\Shake\SAC\%i %N.%S.%C	Whether and how to save processed ground-motion traces
XMLDir	C:\EW\v7.4\params\Shake\input	Directory to write output in XML format
TempDir	C:\EW\v7.4\params\Shake\temp	Directory to temporarily write output in XML format
Debug	51	Debug level
psa1	0.3	Period of 1 <sup>st</sup> psa, in seconds
psa2	1.0	Period of 2 <sup>nd</sup> psa, in seconds
psa3	3.0	Period of 3 <sup>rd</sup> psa, in seconds
@SCNL_par	-	Specific strong motion computation settings for each SCNL

Table 3 - DARACOM parameters and settings

### 2.2.2. "model.d"

This file, pointed in *daramcom.d* configuration file, will contain the regional crustal model used by DARACOM to compute the theoretical P and S waves arrival times. It will be a text file of two columns, separated by blank spaces, where the first column will correspond to the depth and the second one to P-waves velocity (S-waves velocity will be computed

considering a factor of 1.75 under the P-waves velocity). The proposed model is the model used in routine location process at IGC.

0.0	5.5
1.0	5.6
4.0	6.1
11.0	6.4
34	8.0

### 2.2.3. Response files

According with settings of *daracom.d* configuration file, response files for each SCNL will be stored under *respSource* folder with the format DAS\_PZs\_%N\_%S\_%C.resp, where:

- %N = network code for each SCNL.
- %S = station code for each SCNL.
- %C = channel code for each SCNL.

Each file must contain the response of corresponding SCNL in SAC format, in nanometers. (See Appendix 7 **¡Error! No se encuentra el origen de la referencia.**for details).

### 2.2.4. SCNL\_par

In a first iteration, except for clipping limit, no specific strong-motion computations parameters will be set for any SCNL, so all of them will use the same settings, which are:

- *Clipping limit*

Value, in digital counts, beyond which in absolute value, the unprocessed trace should be considered clipped. Clipping values are set for any SCNL according information provided by corresponding station's owner.

- *Taper time interval*

The number of seconds for which a cosine taper will be applied to both end of input time series before it is transformed to the frequency domain. This taper will shorten the useful length of time series from the length specified by the "traceTimes" commands by twice this taper interval. For this initial configuration no taper is applied to time series.

- *Cosine taper definition*

Definition of the cosine taper which is applied to the frequency response function before it is convolved with the trace (see Figure 6).

PARAMETER	VALUE	COMMENTS
taper low-freq off	0.35	Frequency at the low end of passband below which the cosine taper has a value of 0
taper low-freq on	0.4	Frequency at the low end of passband above which the cosine taper has a value of 1
taper high-freq on	90% of Nyquist frequency	Frequency at the high end of passband below which the cosine taper has a value of 1
taper high-freq off	Nyquist frequency	Frequency at the high end of passband above which the cosine taper has a value of 0

Table 4 - Cosine taper definition. See Appendix 8 for details.

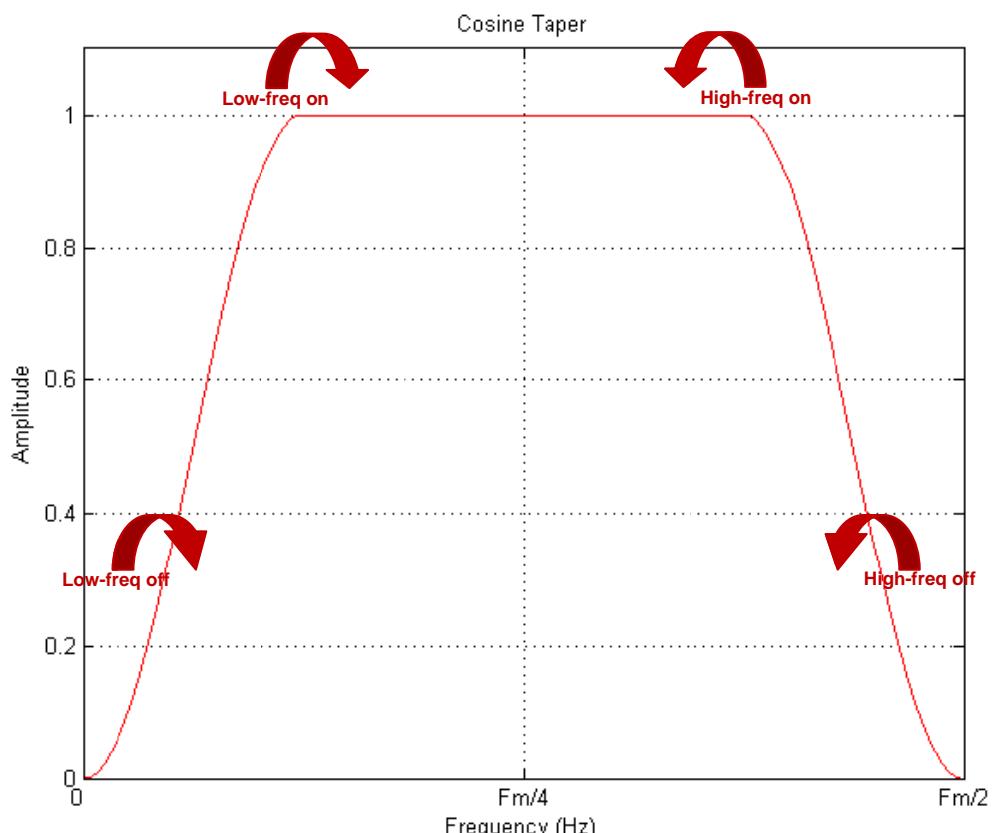


Figure 6 – Example of cosine taper definition with High-freq off = Fnyquist, High-freq on= 75% of Fnyquist, Low-freq on = 25% of Fnyquist and Loq-freq off = 0

### 2.3. Export / Import

Export and Import modules are a pair of modules in charge on communicating both subsystems running on the two different computers where the automation chain is

installed. These two modules are just for an operational purpose without any extra functionality.

The configuration of each of these modules is stored in the respective ".d" configuration file. Most of parameters set for each pair of modules are highly linked, so a proper configuration is required to become the system operational.

### 2.3.1. "export generic.d"

PARAMETER	VALUE	COMMENTS
MyModuleId	MOD_EXPORT_GENERIC	Module ID
RingName	MAIN_RING	Transport ring for input/output
HeartBeatInt	45	Seconds between heartbeats
LogFile	1	Write to logfile and stdout
GetMsgLogo	INST_WILDCARD MOD_DARACOM TYPE_STRONGMOTIONII INST_WILDCARD MOD_DARACOM TYPE_STRONGMOTIONII_END INST_WILDCARD MOD_TRIGGERSM TYPE_HYP2000ARC	Messages to export
ServerIpAddr	84.88.80.25	IP address of Ethernet card to export messages on.
ServerPort	16005	Well-known port to export messages on.
MaxMsgSize	65000	Max size (bytes) for input/output messages
RingSize	100	Number of msgs to buffer for export
SendAliveText	"alive"	String sent to client ad heartbeat
SendAliveInt	30	Seconds between alive msgs sent
RcvAliveText	"alive"	Text of client's heartbeat
RcvAliveInt	120	Seconds between client's heartbeat
SocketDebug	0	Debug is turned off

Table 5 - Export module configuration parameters

### 2.3.2. "import generic.d"

PARAMETER	VALUE	COMMENTS
MyModuleId	MOD_IMPORT_GENERIC	Module ID
RingName	MAIN_RING	Transport ring for input/output
HeartBeatInt	30	Seconds between heartbeats
LogFile	1	Write to logfile and stdout
SenderIpAddr	84.88.80.25	IP address of the machine where to listen.
ServerPort	16005	IP port used by sender
MaxMsgSize	65000	Max size (bytes) for input/output messages
MyAliveString	"alive"	String sent to foreign server
MyAliveInt	15	Seconds between alive msgs sent to server
SenderHeartText	"alive"	Text of client's heartbeat
SenderHeartRate	120	Seconds between client's heartbeat
SocketDebut	0	Debug is turned off
SocketTimeout	240000	Timeout for socket calls in milliseconds

**Table 6 - Import module configuration parameters**

## 2.4. *Shakemap Manager*

Shakemap\_Manager is the last module of the automation chain before launching ShakeMap®. The function of this module is, by one hand, to bring together and organize all input data required by ShakeMap® (data from DARACOM as well as macro seismic data provided by third party agencies and uploaded to the configured ftp server), and by another hand to launch ShakeMap® to compute and generate ShakeMap® products.

As for the modules described above, the configuration of this module is stored plain text file, in this case named “shakemapmgr.d”. Its configuration parameters and set values are shown on Table 7; **Error! No se encuentra el origen de la referencia..**

PARAMETER	VALUE	COMMENTS
MyModuleId	MOD_SHAKEMAPMGR	Module ID
RingName	MAIN_RING	Transport ring for input/output
HeartBeatInt	30	Seconds between heartbeats
LogFile	1	Write to logfile and stdout
GetEventsFrom	INST_WILDCARD MOD_GMEWEX STRONGMOTIONII	List the message logos to grab from transport ring
GetEventsFrom	INST_WILDCARD MOD_TRIGGERSM # HYP2000ARC	List the message logos to grab from transport ring
FTPServerIP	84.88.80.3	IP address of ftp server
FTPServerPort	21	IP port of ftp server
FTPServerUser	macroispyr	Username to login to ftp server configured above
FTPServerPwd	*****	Password for above username
FTPInput	./Data	Path relative to specified ftp username home folder where to find events folders
ShakePath	/home/xsismic/shakemap	Absolute path to ShakeMap® installation folder

**Table 7 - Shakemap\_manager configuration parameters**

## Appendix 1. Shakemap xml files<sup>4</sup>

Before ShakeMap is run for a particular event (identified by an event id), the following set up is needed:

- a directory in <shake\_home>/data/<event\_id>/input
- an 'event.xml' file in this directory
- zero or more files with filenames ending in '\_dat.xml' and other optional files in this directory

The contents of the 'event.xml' file are earthquake parameters in the 'earthquake.dtd' format. This format is a single, empty tag with a number of attributes of the earthquake. The attributes, considering spectral accelerations computed for periods of 0.3, 1.0 and 3.0 seconds are given in the following table.

<b>Event information</b>	
id	the event id
created	file creation time (Unix epoch -- seconds since Jan 1, 1970)
Hypocenter information	
lat	latitude (in decimal degrees, negative in southern hemisphere)
lon	longitude (in decimal degrees, negative in western hemisphere)
depth	in km, positive down
locstring	a free-form descriptive string of location relative to landmarks
mag	magnitude
type	a string specifying the rupture type; the accepted types are RS, SS, NM, and ALL, for reverse slip, strike slip, normal, and unspecified ruptures, respectively.
<b>Origin time parameters</b>	
year	4 digit format
month	1-12
day	1-31
hour	0-23
minute	0-59
second	0-59
timezone	abbreviation (i.e., GMT, PST, PDT)
<b>Amplitudes at the epicenter</b>	
pga	peak acceleration (units of %g)
pgv	peak velocity (units of cm/s)
psa03	Spectral acceleration at 0.3 sec period (units of %g)
psa10	Spectral acceleration at 1.0 sec period (units of %g)
psa30	Spectral acceleration at 3.0 sec period (units of %g)

**Table 8 - Attributes of an event, contained into the event.xml file, considering spectral accelerations computation perios of 0.3, 1.0 and 3.0 seconds.**

The amplitude attributes in 'earthquake.dtd' are estimates produced by ShakeMap during processing. These attributes should be left out of the 'event.xml' file input to ShakeMap, and will be ignored if present.

An example 'event.xml' file looks like:

<sup>4</sup> From ShakeMap v3.5 software guide

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<!DOCTYPE earthquake [
    ... DTD description ...
]>
<earthquake id="14000376" lat="34.2722" lon="-118.7530" mag="3.6"
year="2003" month="10" day="29" hour="23" minute="44" second="48"
timezone="GMT" depth="13.81" locstring="2.6 mi W of Simi Valley, CA"
created="1069292035" />
```

Files in the input directory named like '\*\_dat.xml' are station parameters in the 'stationlist.dtd' format. This format has a root 'stationlist' element containing one or more 'station' elements. The 'stationlist' can have a 'created' attribute with the file creation date in Unix epoch time (seconds since Jan 1, 1970). Each station has a set of attributes:

Attribute	Description
code	the station code
name	station name and/or description
insttype	description of instrument type
lat	station latitude (in decimal degrees)
lon	station longitude (with negative sign in western hemisphere)
source	agency that maintains the station (i.e., SCSN, CDMG, NSMP,...)
netid	the network ID string; for MMI observations this must be one of 'MMI,' 'CIIM,' 'DYFI,' or 'INTENSITY.'
commtype	digital or analog communications (DIG or ANA)
loc	free form text describing the location of the station (optional)
intensity	the intensity value of the observation (decimal)

**Table 9 – Attributes of station element contained at *stationlist***

Each station element contains one or more *comp* elements, one for each component of ground motion. *Comp* elements have the following attributes:

Attribute	Description
name	a channel name/code in SEED convention
originalname	the original channel name if it was not SEED (optional)

**Table 10 – Attributes of component element contained at *stationlist***

The name attribute may be a SEED-convention component name, or it may be a string describing the source of the observation. If the name is not known (for example if the source of amplitudes only gives a single summary value for the station), then use the most generic code for a horizontal component, HL1. Use a horizontal code rather than HLZ because ShakeMap uses only horizontal components in processing. In the ShakeMap output stationlist.xml file, 'name' may also be "DERIVED" to indicate that the ground motions were derived from a primary intensity observation.

If the amplitude is from an agency that does not use SEED component codes, you will have to map their codes to a comparable SEED code for the name attribute. If you would like the original code carried through the processing and used in the HTML, XML, and text *stationlists*, then put the original code in the *originalname* attribute.

Each 'comp' element must contain one 'acc' element, and one 'vel' element, and may contain 'psa03,' 'psa10,' and 'psa30' elements (one of each). These refer to peak acceleration, velocity, and 5%-damped psuedo-spectral acceleration (in this case at 0.3, Shake map automatic process, 2013.04.26

1.0, and 3.0 sec period) values for the named channel at the named station. The acc, vel, psa03, psa10, and psa30 elements are empty but have the following attributes:

Attribute	Description
value	the amplitude value
flag	flag indicating problematic data (optional)

**Table 11 – Attributes of acc, vel, psa03, psa10, and psa30 elements, considering 0.3, 1.0 and 3.0 seconds for psa computations**

The value attributes are expected to have units of:

Attribute	Description
acc	%g (i.e., percent of the earth's nominal gravitational acceleration)
vel	cm/s (centimeters per second)
psa	%g

**Table 12 – Units of acc, vel and psa attributes**

The *flag* attribute indicates problematic data. Any value other than "0" (zero) or "" (i.e., an empty string) will cause ShakeMap to reject the amplitude (and, in fact, all the amplitudes of that type for that station). ShakeMap also does automatic flagging of outliers (see the program *grind* and the section "Running ShakeMap," above, for more information on automatic flagging). Though any non-zero flag will kill amplitude, the following flags are currently defined:

Flag	Meaning
T	Automatically flagged by ShakeMap as an outlier
M	Manually flagged (in <i>grind.conf</i> ) by the ShakeMap operator
G	Amplitude clipped or below the instrument noise threshold
I	Incomplete (a data gap existed in the time window used to calculate the amplitude)

**Table 13 – Definition of flags used at ShakeMap**

An example of a \*\_dat.xml' file is:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<!DOCTYPE stationlist [
    ... DTD description ...
]>
<stationlist created="1070030689">
<station code="ADO" name="Adelanto Receiving Station" insttype="TriNet"
lat="34.55046" lon="-117.43391" source="SCSN and TriNet" commtype="DIG"
netid="CI" loc="Adelanto, on Hwy 395 ">
<comp name="HHE">
<acc value="0.0083" flag="0" />
<vel value="0.0030" flag="0" />
<psa02 value="0.0146" flag="0" />
<psa10 value="0.0049" flag="0" />
<psa20 value="0.0003" flag="0" />
</comp>
```

```

<comp name="HHN">
<acc value="0.0088" flag="0" />
<vel value="0.0028" flag="0" />
<psa02 value="0.0111" flag="0" />
<psa10 value="0.0040" flag="0" />
<psa20 value="0.0004" flag="0" />
</comp>
<comp name="HZH">
<acc value="0.0087" flag="0" />
<vel value="0.0016" flag="0" />
<psa03 value="0.0080" flag="0" />
<psa10 value="0.0013" flag="0" />
<psa30 value="0.0002" flag="0" />
</comp>
</station>

... additional station tags (omitted)...

<station code="WSS" name="West Side Station" insttype="TriNet" lat="34.1717"
lon="-118.64971" source="SCSN and TriNet" commtype="DIG" netid="CI"
loc="Hidden Hills, Valley Circle Dr.">
<comp name="HHE">
<acc value="0.0225" flag="0" />
<vel value="0.0031" flag="0" />
<psa03 value="0.0182" flag="0" />
<psa10 value="0.0016" flag="0" />
<psa30 value="0.0002" flag="0" />
</comp>
<comp name="HHN">
<acc value="0.0209" flag="0" />
<vel value="0.0029" flag="0" />
<psa03 value="0.0234" flag="0" />
<psa10 value="0.0019" flag="0" />
<psa30 value="0.0001" flag="0" />
</comp>
<comp name="HZH">
<acc value="0.0187" flag="0" />
<vel value="0.0020" flag="0" />
<psa03 value="0.0073" flag="0" />
<psa10 value="0.0005" flag="0" />
<psa30 value="0.0000" flag="0" />
</comp>
</station>
</stationlist>
```

Intensity data uses the same format of input XML as other ground motion data, but uses two new attributes to the *station* tag: the *intensity* attribute should be set to the decimal intensity for the “station;” the *netid* attribute should be set to “MMI,” “CIIM,” “DYFI,” or “INTENSITY” (all three are currently equivalent). If *netid* is set to one of these values, any amplitude data (i.e., data enclosed in a *comp* tag) will be ignored and *grind* will use the *mmi2pgm* function to derive the ground motions. Likewise, if *netid* is not one of these values, the *intensity* attribute will be ignored and *grind* will compute intensity using the *pgm2mmi* function.

Below is an example of a station tag that contains intensity information:

```
<station code="91042" name="ZIP Code 91042 (Intensity VII, 38 responses)" insttype="USGS (Did You Feel It?)" lat="34.282604" lon="-118.237943" source="USGS (Did You Feel It?)" netid="CIIM" commtype="USGS (Did You Feel It?)" intensity="7.4">
```

The earthquake and stationlist XML files are combined in the output file provided to the public. This file is made available as XML and is also the basis for a raw, non-XML text stationlist and the HTML web stationlist linked to the ShakeMap click-maps. Since the output XML file combines the event and station files, it also merges the earthquake and stationlist DTD's into a 'shakemap\_data' DTD that is included in the file.

## Appendix 2. Trigger module configuration file

Configuration file of *trigger module* will be an XML like file with the following parameters:

<b>ftp (FTP server information)</b>	
host	IP address of FTP server, or FQDN.
port	Port of FTP server (21 by default).
username	Username to access appropriate home folder of ftp server with RW permissions.
password	Password corresponding to username mentioned above.
tc	Time interval, in minutes, to checking ftp site from new event XML files.
tpurge	Time interval between purge operations of <data> folder at the ftp site, in hours.
initialpurge	Time for the first purge of the of <data> folder at the ftp site, in the format <i>hh:MM</i>
shakeonrelocate	(Optional) Flag (1=true and 0=false) to generate a new shake map just after receiving a relocation event.xml input file in case of true, or not in case of false. Default: 1
<b>trigger (more than one trigger is allowed).</b>	
name	Trigger ID. Must to be unique.
latmin	Minimum latitude (in decimal degrees, negative in southern hemisphere).
latmax	Maximum latitude (in decimal degrees, negative in southern hemisphere).
longmin	Minimum longitude (in decimal degrees, negative in western hemisphere).
longmax	Maximum longitude (in decimal degrees, negative in western hemisphere).
depthmin	Minimum depth in km, positive down. Value included in triggering conditions.
depthmax	Maximum depth in km, positive down. Value not included in triggering conditions.
magmin	Minimum magnitude. Value included in triggering conditions.
magmax	Maximum magnitude. Value not included in triggering conditions.
shape	(Optional) Absolute path, including filename, to an ESRI shape defining a region for this trigger. Event coordinates will be checked against this region after succeeding in conditions above.
<b>shake (more than one shake per trigger is allowed).</b>	
name	Shake ID. Must to be unique for each trigger.
delay	Delay, in minutes, after event's origin time, to generate the shake map.

Table 14 - Parameters of trigger module XML configuration file

An example of *trigger module* configuration file should be like:

```
<ftp host="172.18.118.25" port="21" username="user" password="password"  
tc="1" tpurge="24" initialpurge="01:00" />  
<trigger name="zone1" latmin="40.0000" latmax="43.0000" longmin="-2.0000"  
longmax="3.0000" depthmin="0.000" depthmax="25.0000" magmin="3.5"  
magmax="5.0" shape="C:\Sispyr\Shakemap\Shape\sispyr.shp">  
<shake name="shake1" delay="0" />  
<shake name="shake2" delay="30" />  
</trigger>  
<trigger name="zone2" latmin="41.0000" latmax="42.0000" longmin="-1.0000"  
longmax="2.0000" depthmin="0.000" depthmax="25.0000" magmin="5.0"  
magmax="8.0" >  
<shake name="shake1" delay="5" />  
</trigger>
```

### Appendix 3. DARACOM module configuration file

Configuration file of *PG&SA computation module* will be text file with, at least, the following parameters:

Parameter	Description
traceSource NRTServer ip:port	(Required) IP and port for the NRTServer which will be used a trace data source.  Default: none Example: traceSource NRTServer 127.0.0.1:12345
maxSta N	(Required) At startup, the module will allocate space for N individual stations (unique station/network names.) Each station may have any number of different components. If the module tries to read more than N stations, the excess ones will be skipped with a logged warning message. The order that stations will be read into the module will be determined by the trace source and thus may be arbitrary.  Default: none Example: maxSta 100
maxTrace M	(Required) Allocate memory for M “traceTimes” command and the estimated P and S phase arrival times.  Default: none Example: maxTrace 60000
Add STA COMP NET LOC	(Optional) Will add the trace(s) with station name STA, component name COMP, network name NET, and location code LOC to the selection list. Any of STA, COMP and NET may be the wildcard character ‘*’. COMP may be given as the first two letters of the component name, to select all direction designators (North and East) will be accepted for that component. Zero, one or many “Add” commands may be listed in the configuration file. If no “Add” commands are given, all SCNLs from the trace source will be selected. The “Del” command may be used to narrow the selection implied by wildcard values in an “Add” command or by the absence of any “Add” commands.  Default: all traces are selected Example : Add * BH * Add SEA EH UW
Del STA COMP NET LOC	(Optional) Will delete the trace(s) with station name STA, component name COMP, network name NET, and location code LOC from the selection list. Any of STA, COMP, NET and LOC may be the wildcard character ‘*’. COMP may be given as the first two

Parameter	Description
	<p>letters of the component name, to select all direction designators (Vertical, North and East) are accepted for that component. Zero, one or many "Del" commands may be listed in the configuration file.</p> <p><b>Default:</b> all traces are selected  <b>Example :</b> Del SEA EH UW --</p>
DistanceFilter dist mag_min mag_max	<p>(Optional, and many allowed)</p> <p>Filtering by a distance from a given hypocenter, in km without decimals; only applied if event magnitude is greater or equal to mag_min, and lower than mag_max.</p> <p>In case that many exist, the first one (processed from top to bottom) which matches the conditions will be applied, and the other ones will be skipped.</p> <p><b>Default:</b> disabled  <b>Example:</b> DistanceFilter 150 0.0 4.5</p>
BoxFilter latmin longmin latmax lonmax	<p>(Optional)</p> <p>Filtering considering all stations inside a given box defined as: latmin longmin latmax longmax</p> <p><b>Default:</b> disabled  <b>Example:</b> BoxFilter 40 0 43 3</p>
traceTimes START END	<p>(Optional)</p> <p>Specify the start and end times of trace data to be used from any trace source.</p> <p><b>Default:</b> traceTimes 5.0 60.0  <b>Example:</b> traceTimes 10.0 40.0</p>
saveTrace ST [params] DIR FORMAT	<p>(Optional)</p> <p>Tells the module whether and how to save synthetic traces. If the "saveTrace" command is absent, no traces will be saved. Choices for ST include:</p> <p>SAC baseDir dirFormat filename-format</p> <p>Save synthetic traces in SAC-format files. The full pathname for each SAC file will be made up of base directory, formatted directory, and formatted filename plus a descriptive ending; all concatenated together with appropriate path separators. The endings are "-acc", "-vel", "-disp", "-psa02", "-psa10" and "-psa20" for the appropriate traces.</p> <p>baseDir</p> <p>Specifies a fixed directory name. This can be an absolute directory path or a path relative to the current directory. It will contain one or more parts with pathname separators. All components of this path (except possibly the last) must exist before the module is started.</p> <p>dirFormat</p> <p>Gives a formatted subdirectory name; the format</p>

Parameter	Description
	<p>string is that used for the date command applied to the event origin time, with the addition of `'%i' to indicate the event ID. The directory name derived from <code>dirFormat</code> must not contain any path separators. Suitable format strings include:</p> <ul style="list-style-type: none"> <li>%C Century number (the year divided by 100 and truncated to an integer as a decimal number [1,99]); single digits are preceded by 0.</li> <li>%d Day of month [1,31]; single digits are preceded by 0.</li> <li>%h Locale's abbreviated month name.</li> <li>%H Hour (24-hour clock) [0,23]; single digits are preceded by 0.</li> <li>%i The event ID.</li> <li>%j Day number of year [1,366]; single digits are preceded by 0.</li> <li>%m Month number [1,12]; single digits are preceded by 0.</li> <li>%M Minute [00,59]; leading zero is permitted but not required.</li> <li>%R Time as %H:%M</li> <li>%S Seconds [00,61]</li> <li>%T Time as %H:%M:%S</li> <li>%u Weekday as a decimal number [1,7], with 1 representing Sunday.</li> <li>%U Week number of year as a decimal number [00,53], with Sunday as the first day of week 1.</li> <li>%V Week number of the year as a decimal number [01,53], with Monday as the first day of the week. If the week containing 1 January has four or more days in the new year, then it is considered week 1; otherwise, it is week 53 of the previous year, and the next week is week 1.</li> <li>%w Weekday as a decimal number [0,6], with 0 representing Sunday.</li> <li>%W</li> </ul>

Parameter	Description
	<p>Week number of year as a decimal number [00,53], with Monday as the first day of week 1.  %Y  Year within century [00,99].  %Y  Year, including the century (for example 1993),  filename-format  Gives the formatted file name using % to introduce one of the format specifiers "sScCnNLI%" 's' is the station name in lower case; 'S' is upper case. Likewise for component and network names; '%' stands for itself. All other characters are taken literally. This works in the same way as the format string for response files.</p> <p>The module will add the following special fields to SAC file headers. The peak amplitude is written to user0; in t0 is the time, relative to event origin, of the peak amplitude. In kuser0 and kt0 are the labels for these user values. For the acceleration, the labels would be "Acc_max" and "Acc_amp", respectively. Other traces have similar labels. The SAC header variable kinst will have the units for the trace, such as "cm/sec^2" for acceleration.</p> <p><b>Default:</b> command is absent (no traces are saved)  <b>Example :</b> SAC /shake/SAC/GM %Y%j%i %S.%C.%N</p>
searchWindow A B C D	<p>(Optional)</p> <p>Will specify the time interval in which the module will search for peak amplitudes in the synthetic traces. Together with the P- and S-phase arrival times estimated from the “velocity model” these four parameters will set the start and end times of this search window. The four parameters are:</p> <p>A:  The multiple of the estimated interval P - S to start the search before estimated S arrival. Use a negative value to start after the S arrival.</p> <p>B:  The minimum number of seconds before estimated S arrival to start the peak search.</p> <p>C:  The multiple of the estimated interval P - S to end the search after the estimated S arrival.</p> <p>D:  The minimum number of seconds after estimated S arrival to start the peak search.</p> <p><b>Default:</b> searchWindow 0.0 2.0 0.0 30.0 # Search window runs from 2 seconds before to 30 seconds after the estimated S arrival,</p>

Parameter	Description																
	<p>independent of the P - S interval. Example : searchWindow 0.1 2.0 2.0 15.0</p>																
respSource source params ]	<p>(Required) Tells the module where to find instrument response data. Choices for SOURCE will be:  <pre>FILE dirname pz-filename-format       find response files in the dirname directory. pz-       filename-format is a string similar to the printf       format: %S, %C, %N are replaced by station,       component and network names, respectively, all in       upper case. Similarly %s, %c, %n work for lower-case       station, component and network. The digraph %%       stands for %; all other characters are taken literally.</pre> <p>The response file format is similar to that used by SAC POLEZERO files with some extra requirements. The options in the file are keyword driven and the numbers are in free format. You may specify a multiplicative scaling constant by putting a line in the file containing the keyword "CONSTANT" followed by a floating point number. The default for this constant is 1.0 if you omit this line. You specify the number of poles by putting a line in the file with the keyword "POLES" following by an integer number. The next lines in the file until another keyword is read become the poles for this instrument. Each such line contains two floating point numbers specifying the real and imaginary parts of one of the poles. If you have fewer lines specifying poles than you stated on the "POLES" line, the remaining poles are assumed to lie at the origin. You specify the zeros in the same way with a "ZEROS" keyword line following by lines specifying the zeros that do not lie at the origin. You may specify up to as many poles and zeros as you need.</p> <p>The poles, zeros and gain constant of the response file must be for an input of displacement in nanometers. The poles and zeros specify the Laplace transform of the analogue instrument response. The module will not handle digital FIR or IIR filter responses. For example, the following could be the specification for the one broadband seismometer:</p> <table> <tbody> <tr> <td>CONSTANT</td> <td>0.50280E+11</td> </tr> <tr> <td>ZEROS</td> <td>3</td> </tr> <tr> <td>    0.00000E+00</td> <td>0.00000E+00</td> </tr> <tr> <td>    0.00000E+00</td> <td>0.00000E+00</td> </tr> <tr> <td>    0.00000E+00</td> <td>0.00000E+00</td> </tr> <tr> <td>POLES</td> <td>6</td> </tr> <tr> <td>    -0.31420E-01</td> <td>0.00000E+00</td> </tr> <tr> <td>    -0.19790E+00</td> <td>0.00000E+00</td> </tr> </tbody> </table> </p>	CONSTANT	0.50280E+11	ZEROS	3	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	0.00000E+00	POLES	6	-0.31420E-01	0.00000E+00	-0.19790E+00	0.00000E+00
CONSTANT	0.50280E+11																
ZEROS	3																
0.00000E+00	0.00000E+00																
0.00000E+00	0.00000E+00																
0.00000E+00	0.00000E+00																
POLES	6																
-0.31420E-01	0.00000E+00																
-0.19790E+00	0.00000E+00																

<b>Parameter</b>	<b>Description</b>
	<p>-0.20110E+03                    0.00000E+00                            -0.69740E+03            0.00000E+00                            -0.75400E+03            0.00000E+00                            -0.10560E+04            0.00000E+00</p> <p><b>EWDB</b>                            Query a Database for response information. It will not be implemented at this version; it is just for a future use.</p> <p>Default: none                            Example : File /earthworm/responses %S_%C_%N.pz</p>
<b>staLoc NRTServer</b>	<p>(Required)                            Tells the module to get station location information from NRTServer. This is a constant value, and should not be changed. It is provided for future system expansion.</p> <p>Default: NRTServer                            Example : staLoc NRTServer</p>
<b>velocity model</b>	<p>(Required)                            Read in the one-dimensional velocity model to be used to estimate P and S phase arrival times. This is done using the syntax:</p> <p style="text-align: center;">@velocity_file</p> <p>The module will always look for this file in the current directory, so appropriate path information must be included if the file is located elsewhere.</p> <p>Default: none                            Example : staLoc File /shake/stas/uw_stal.hinv</p>
<b>SCNLpar STA COMP NET LOC special-parameters</b>	<p>(Optional)                            Set certain parameters (described below) for specific traces identified by their SCNL: STA, COMP, and NET (station/component/network name.) No wildcards are permitted here; each SCNL must be given explicitly, but only if special values are needed for that SCNL. If there are only a few of these commands, they may be listed in the configuration file. But if a large number of them are needed, it may be more convenient to place them in a separate file. Then that file will get included with the configuration file by the syntax:</p> <p style="text-align: center;">@scnl_param_file</p> <p>Each SCNLpar command must include the STA, COMP, NET, LOC names followed by the following seven decimal values. Use spaces between all eleven items in each SCNLpar line. All values must be present; no default values are used for an SCN if it has an SCNpar line. The seven decimal values are:</p>

Parameter	Description
	<p>magnitude correction</p> <p>Not will be used at this version. It is just for future use.</p> <p>taper low-freq off</p> <p>The frequency at the low end of the passband below which the cosine taper has zero value. This taper is applied to the frequency response function before it is convolved with the trace. Frequency units are Hz.</p> <p>taper low-freq on</p> <p>The frequency at the low end of the passband above which the cosine taper has a value of 1. The low-end taper can be eliminated by setting the off and on values to the same value. The default low-end taper is turned off, passing all low frequencies.</p> <p>taper high-freq on</p> <p>The frequency at the high end of the passband below which the cosine taper has a value of 1.</p> <p>taper high-freq off</p> <p>The frequency at the high end of the passband above which the cosine taper has a value of 0. The high-end taper can be eliminated by setting the off and on values to the same value. The default high-end taper has an off value equal to the trace Nyquist frequency (one half the sample rate.) The default on frequency is 90% of the Nyquist frequency.</p> <p>clipping limit</p> <p>The value, in digital counts, beyond which in absolute value the unprocessed trace should be considered clipped. If the trace is declared clipped by the module, it will synthesize into ground motion traces, but it will not have amplitude picks performed. The default clipping limit is 7.55e+06 counts, 90% of 2^23, the limit of a 24-bit digitizer.</p> <p>taper time interval</p> <p>The number of seconds for which a cosine taper will be applied to both ends of the input time series before it is transformed to the frequency domain. This taper will shorten the useful length of the time series from the length specified by the "traceTimes" command by twice this taper interval. The default value is 0 - no</p>

<b>Parameter</b>	<b>Description</b>
	<p>taper is applied to time series.</p> <p><b>Default:</b> as described above  <b>Example :</b> SCNLpar SEA EHE UW -- 0.2 0.1 0.1 20  25 2.9e4 1.0</p>
<b>psa1 t1</b>	<p>(Optional)</p> <p>Set the first period for PSA computation, been <math>0 \leq t1 \leq 9.9</math>, expressed in seconds with one decimal. In case of error default value will be used.</p> <p><b>Default:</b> 0.3  <b>Example :</b> psa1 0.2</p>
<b>psa2 t2</b>	<p>(Optional)</p> <p>Set the first period for PSA computation, been <math>0 \leq t2 \leq 9.9</math>, expressed in seconds with one decimal. In case of error default value will be used.</p> <p><b>Default:</b> 1.0  <b>Example :</b> psa2 1.0</p>
<b>psa3 t3</b>	<p>(Optional)</p> <p>Set the first period for PSA computation, been <math>0 \leq t3 \leq 9.9</math>, expressed in seconds with one decimal. In case of error default value will be used.</p> <p><b>Default:</b> 3.0  <b>Example :</b> psa3 2.0</p>
<b>Debug D</b>	<p>(Optional)</p> <p>Set the debug level to D. There are many different debug options; one or more of them may be activated using the Debug command. More than one Debug command may be used, or the different values (from the table) may be added together into one Debug command. Except as noted, the debug information is printed to STDERR and the log file (depending on the setting of "log switch".) Select from these debug options:</p> <p>1:  trace and search times and P and S arrival estimates  (relative to event origin time)</p> <p>2:  SCNL selection tests</p> <p>16:  waveform_client debugging</p> <p>32:  poles. zeros and gain values</p> <p>64:</p>

Parameter	Description
	<p>trial frequency response functions to STDOUT. Produces about 1500 lines for each SCNL, which should be saved to a file.</p> <p>128: full frequency response function to STDOUT. Produces several thousand lines for each SCNL, which should be saved to a file.</p> <p>256: Input and output trace data including in padded area to STDOUT. Produces several thousand lines for each SCNL, which should be saved to a file.</p> <p>Default: 0 ; no debug output Example : Debug 3 # turns on options 1 and 2</p>
log switch: -ls	<p>(Optional) This is not a config-file command but a command line switch Sets the value of the logging switch to s. Possible values of s are:</p> <p>0: Do not create a log file. Some logging data will be printed to the screen (stdout or stderr.)</p> <p>1: Create a log file. The log file name will based on the config-file name and the current date. A new file will be created for each day (but only if there are logging entries to be made.) Some logging data will be printed to the screen (stdout or stderr,) as with option '0' above</p> <p>2: Create a log file as for option '1', but do not write anything to the screen (stdout or stderr.)</p> <p>Default: 1 Example (on the console) : -l0 (lower-case ell zero ; turns off creation of log file)</p>

Table 15 - Parameters of DARACOM module configuration file

## Appendix 4. Export module configuration file

Configuration file of *export module* will be text file with, at least, the following parameters:

Parameter	Description
ServerIPAddr ip	(Required) Export messages via this Ethernet card  Default: none Example: ServerIPAddr 172.18.148.23
ServerPort port	(Required) Well-known port number to export messages on.  Default: none Example: ServerPort 16005
MaxMsgSize m	(Required) maximum size (bytes) for input/output messages  Default: none Example: MaxMsgSize 128
RingSize r	(Required) number of messages to buffer for export  Default: none Example: RingSize 100
SocketTimeout time	(Required) Timeout length in milliseconds for socket calls  Default: none Example: SocketTimeout 200000
SocketDebug n	(Required) if 1, socket_debug statements are logged, and if 0, socket debug is turned off  Default: none Example: SocketDebug 0

Table 16 - Parameters of export module configuration file

## Appendix 5. Import module configuration file

Configuration file of *import* module will be a text file with, at least, the following parameters:

Parameter	Description
SenderIpAddr ip	(Required) Ip address of the machine we're to listen to  Default: none Example: SenderIpAddr 172.18.148.23
SenderPort port	(Required) IP port number used by sender.  Default: none Example: SenderPort 16005
SocketTimeout time	(Required) Timeout length in milliseconds for socket calls  Default: none Example: SocketTimeout 200000
SocketDebug n	(Required) if 1, socket_debug statements are logged, and if 0, socket debug is turned off  Default: none Example: SocketDebug 0

Table 17 - Parameters of import module configuration file

## Appendix 6. ShakeMap manager configuration file

Configuration file of *ShakeMap manager* module will be a text file with, at least, the following parameters:

Parameter	Description
FtpServerIp ip	(Required) IP address of the ftp server where input files are stored  Default: none Example: FtpServerIp 172.18.148.23
FtpServerPort port	(Optional) Port number of the ftp server which IP address has been specified using FtpServerIp command.  Default: 21 Example: FtpServerPort 21
FtpServerUser username	(Required) Username to access the ftp server specified as FtpServerIp: FtpServerPort.  Default: none Example: FtpServerUser shake
FtpServerPwd pass	(Required) Password to access the ftp server specified as FtpServerIp: FtpServerPort using the user username.  Default: none Example: FtpServerPwd shake
FtpInput infolder	(Required) Relative path, from the user username ftp home folder, to the input folder where ShakeMap's input files are stored at the ftp server.  Default: none Example: FtpInput ./input
ShakePath shpath	(Required) ShakeMap home directory. Relative and complete paths can be used.  Default: none Example: ShakePath ../../shakemap
Verbosity v	(Optional) Logging verbosity.  Default: 1 Example: Verbosity 1
Timeout t	(Optional) Timeout in seconds, since an event start being processed until the <i>ShakeMap manager</i> module launches the ShakeMap

Parameter	Description
	<p>generation. This timeout begins counting when the ShakeMap manager receives a “starting event processing” message from DARACOM module.</p> <p>Once the DARACOM module finishes processing all SCNL’s corresponding to an event, it will send a “finished event processing” message to <i>ShakeMap manager</i> module, and if it is received before than <math>t</math> seconds since the corresponding “starting event processing” message has been received, the system will launch the ShakeMap generation and the timeout count down will be aborted. Otherwise, the “finished event processing” message will be not taken into account.</p> <p>It is recommended to configure this timeout, at least, twice the typical event processing time</p> <p>Default: not used Example: Timeout 120</p>

Table 18 - Parameters of ShakeMap manager module configuration file

## Appendix 7. **Channels responses**

At this appendix detailed response information, for each SCNL configured at DARACOM module, is provided.

In view of the fact that DARACOM will not consider digitals stages of responses, they have been avoided, after checking that their impact over the complete channel response can be disregarded. So, only analogical and ADC stages have been taken into account to generate response files used by DARACOM.

According with DARACOM specifications, response files are provided in SAC format, in units of nanometres, with poles and zeroes in rad/s.

**NSCL code:****CA.ARBS.HHE****Coordinates (ERTS89)**

Latitude: 42.434553N

Country: Andorra

Longitude: 1.533475E

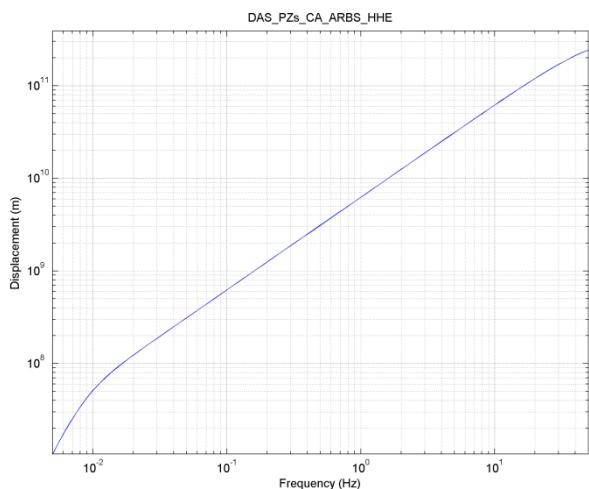
Municipality: Sant Julià

Elevation: 2145 m

Owner: IEA

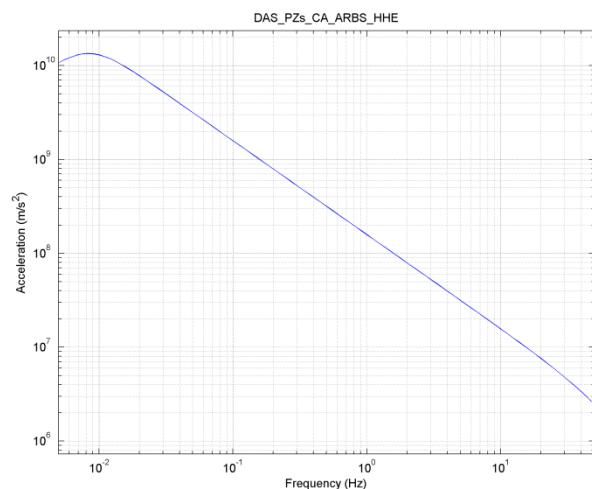
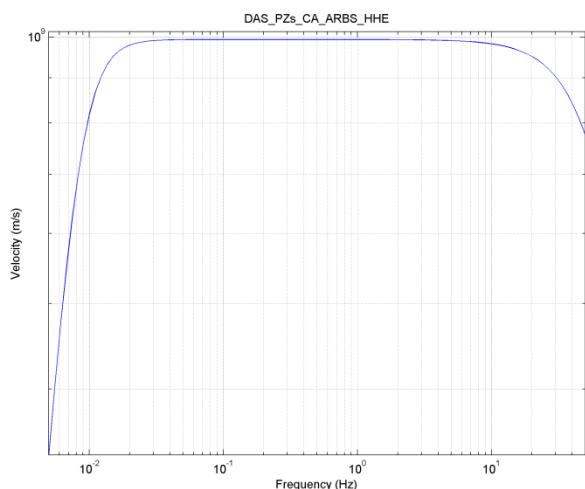
**Channel response**

Sensitivity	9.933000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



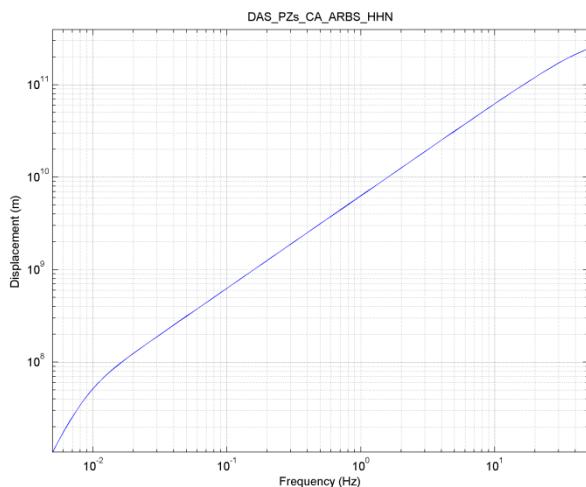
ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.578245E+12

Amplitudes in nm and poles and zeros in rad/s



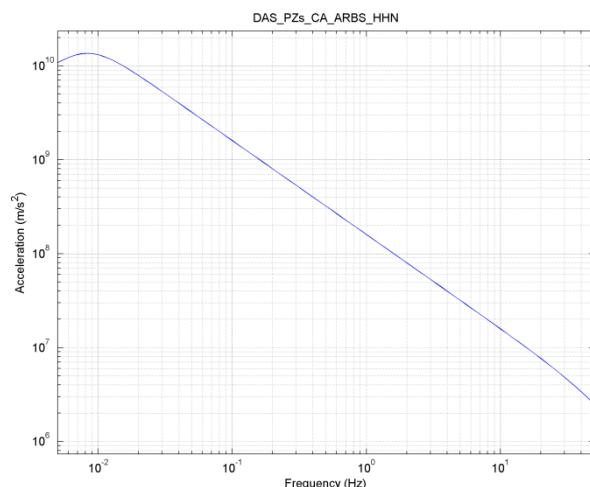
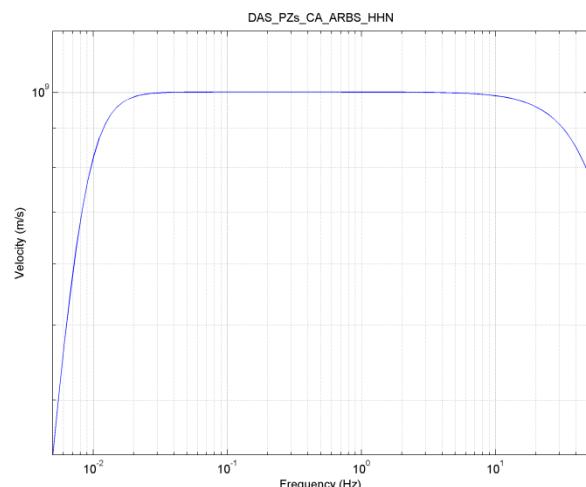
**NSCL code:****CA.ARBS.HHN****Coordinates (ERTS89)**Latitude: **42.434553N**Country: **Andorra**Longitude: **1.533475E**Municipality: **Sant Julià**Elevation: **2145 m**Owner: **IEA****Channel response**

Sensitivity	<b>9.787000E+08</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.639219E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.ARBS.HHZ****Coordinates (ERTS89)**

Latitude: 42.434553N

Country: Andorra

Longitude: 1.533475E

Municipality: Sant Julià

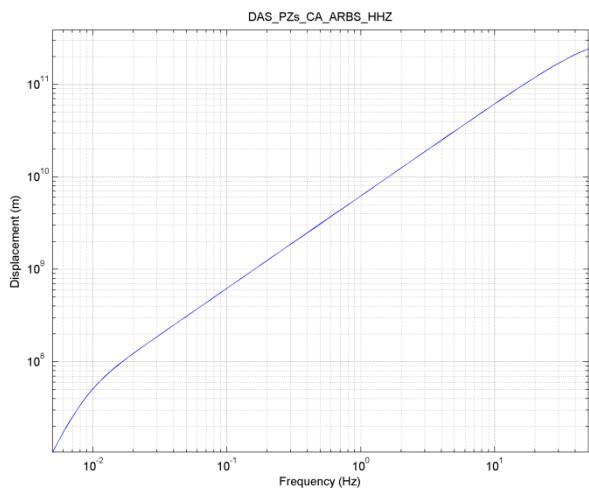
Elevation: 2145 m

Owner: IEA

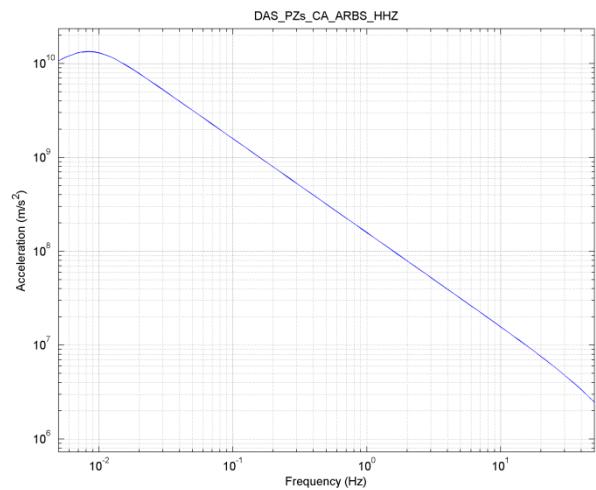
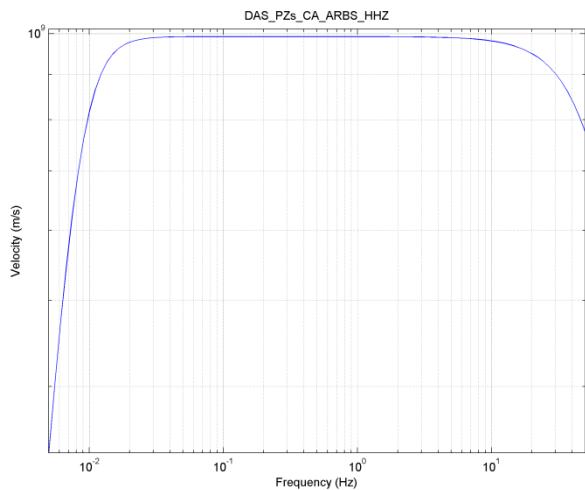
**Channel response**

Sensitivity	9.880000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100

ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7. 568082E+12



Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.RATE.HHE.00****Coordinates (ERTS89)**

Latitude: 43.085800N

Country: France

Longitude: 0.700330W

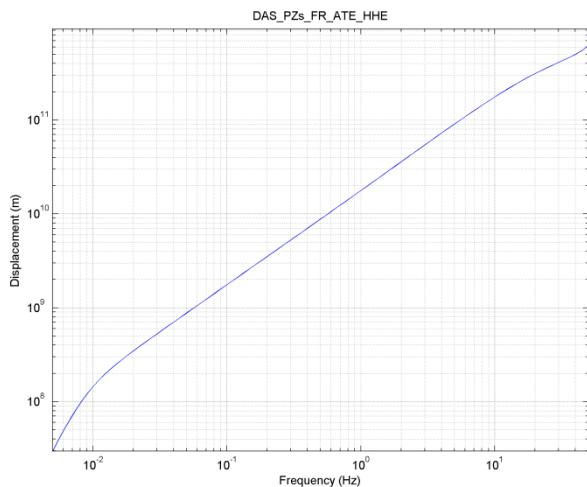
Municipality: Arette

Elevation: 480 m

Owner: OMP

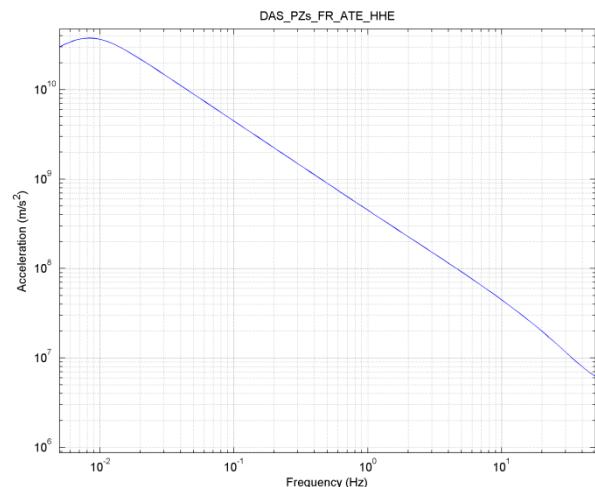
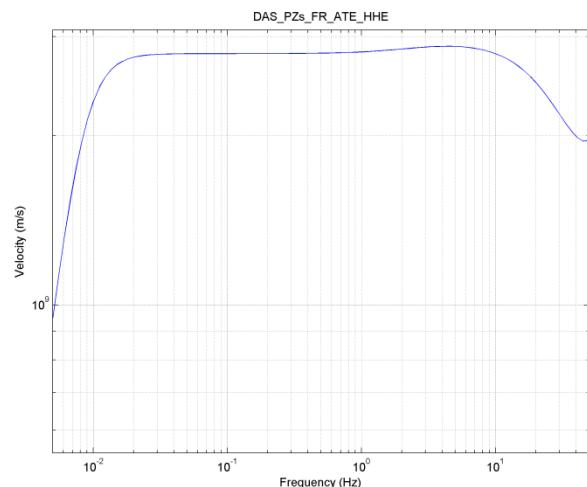
**Channel response**

Sensitivity	2.796200E+09
Freq. of sensitivity (Hz)	0.05
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 6  
 0.0000 0.0000  
 0.0000 0.0000  
 0.0000 0.0000  
 -15.1425 0.0000  
 -304.4904 431.4691  
 -304.4904 -431.4691  
 POLES 7  
 -0.0370 0.0370  
 -0.0370 -0.0370  
 -15.9718 0.0000  
 -93.5942 429.7488  
 -93.5942 -429.7488  
 -405.8934 0.0000  
 -188.4954 0.0000  
 CONSTANT 1.565796E+5

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.ATE.HHN.00****Coordinates (ERTS89)**

Latitude: 43.085800N

Country: France

Longitude: 0.700330W

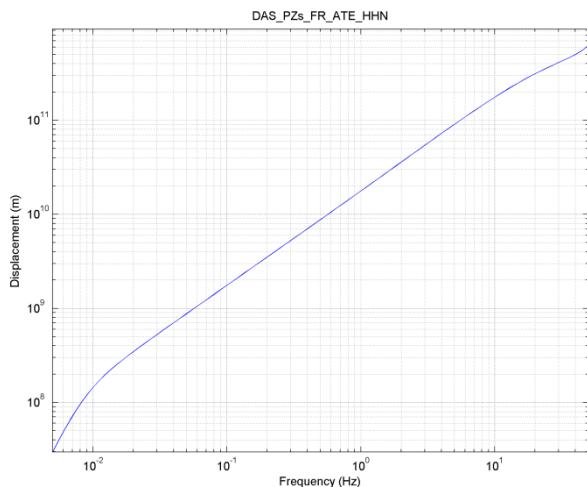
Municipality: Arette

Elevation: 480 m

Owner: OMP

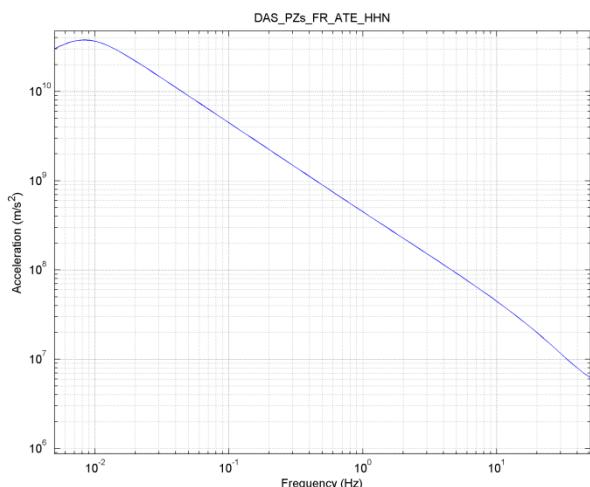
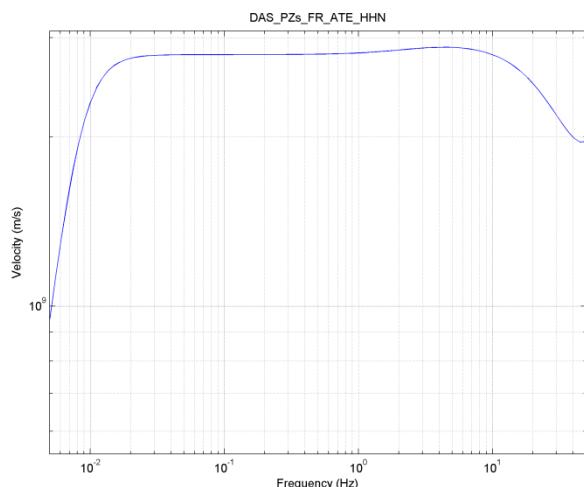
**Channel response**

Sensitivity	2.796200E+09
Freq. of sensitivity (Hz)	0.05
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 6  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-15.1425 0.0000  
-304.4904 431.4691  
-304.4904 -431.4691  
POLES 7  
-0.0370 0.0370  
-0.0370 -0.0370  
-15.9718 0.0000  
-93.5942 429.7488  
-93.5942 -429.7488  
-405.8934 0.0000  
-188.4954 0.0000  
CONSTANT 1.565796E+5

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.RATE.HHZ.00****Coordinates (ERTS89)**

Latitude: 43.085800N

Country: France

Longitude: 0.700330W

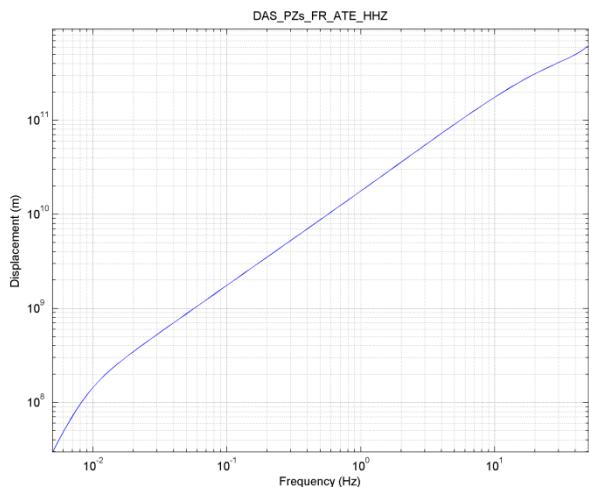
Municipality: Arette

Elevation: 480 m

Owner: OMP

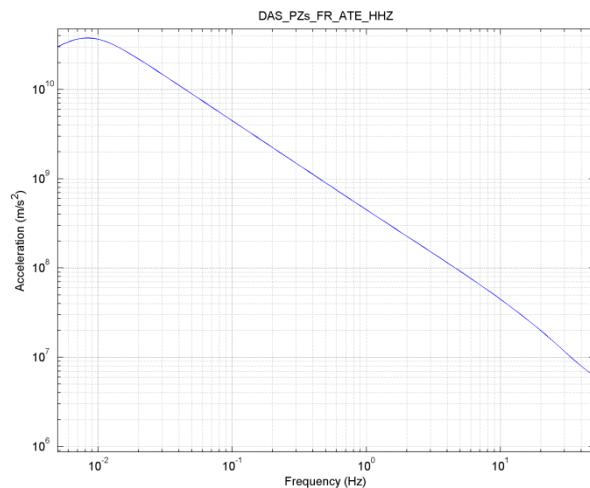
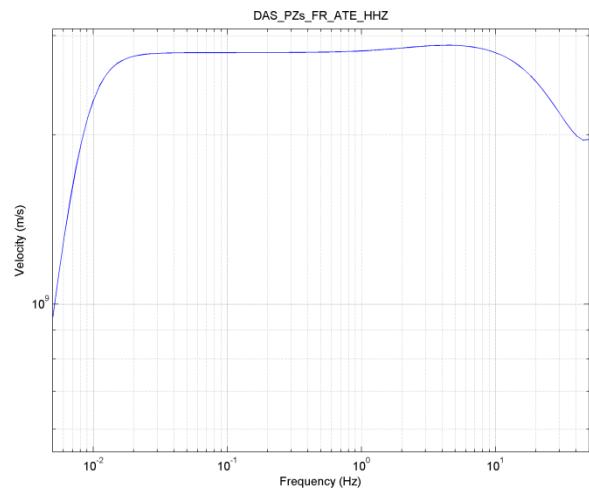
**Channel response**

Sensitivity	2.796200E+09
Freq. of sensitivity (Hz)	0.05
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 6  
 0.0000 0.0000  
 0.0000 0.0000  
 0.0000 0.0000  
 -15.1425 0.0000  
 -304.4904 431.4691  
 -304.4904 -431.4691  
 POLES 7  
 -0.0370 0.0370  
 -0.0370 -0.0370  
 -15.9718 0.0000  
 -93.5942 429.7488  
 -93.5942 -429.7488  
 -405.8934 0.0000  
 -188.4954 0.0000  
 CONSTANT 1.565796E+5

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.AVIN.HNE****Coordinates (ERTS89)**

Latitude: 41.843810N

Country: Spain

Longitude: 1.965460E

Municipality: Avinyó

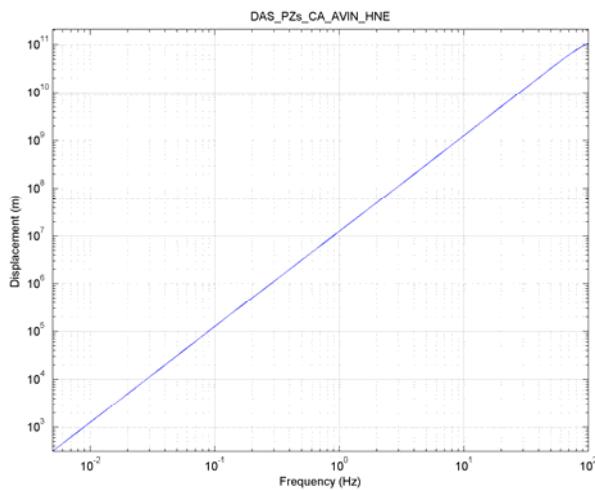
Elevation: 334 m

Owner: IGC

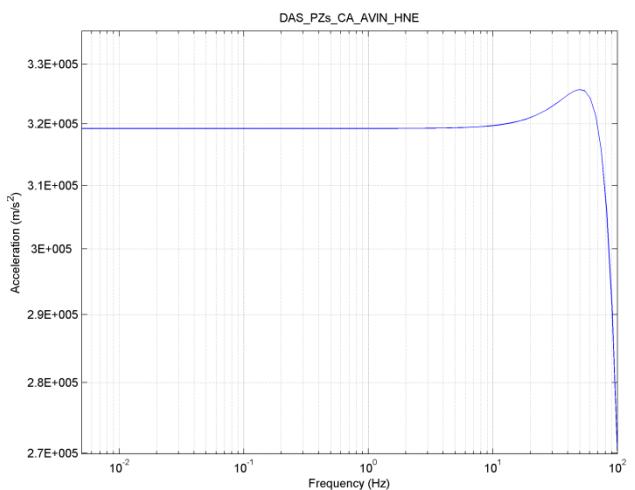
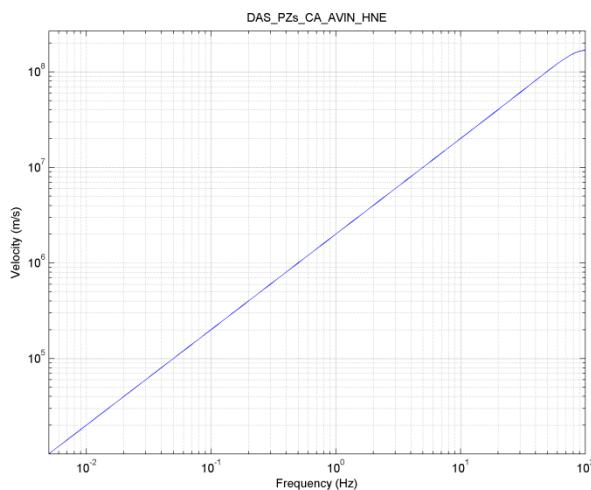
**Channel response**

Sensitivity	3.192587E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200

ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.650857E+8

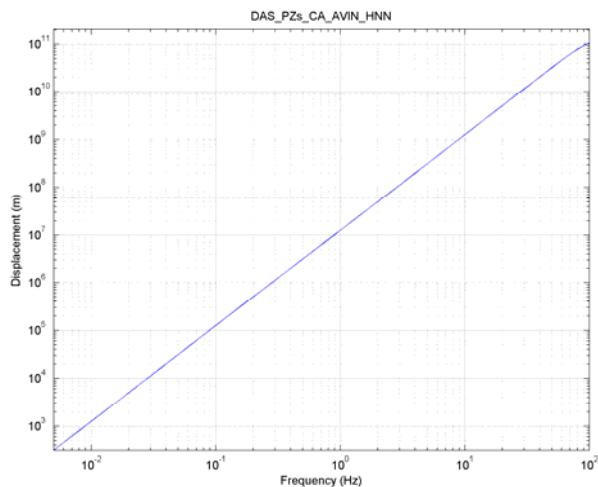


Amplitudes in nm and poles and zeros in rad/s



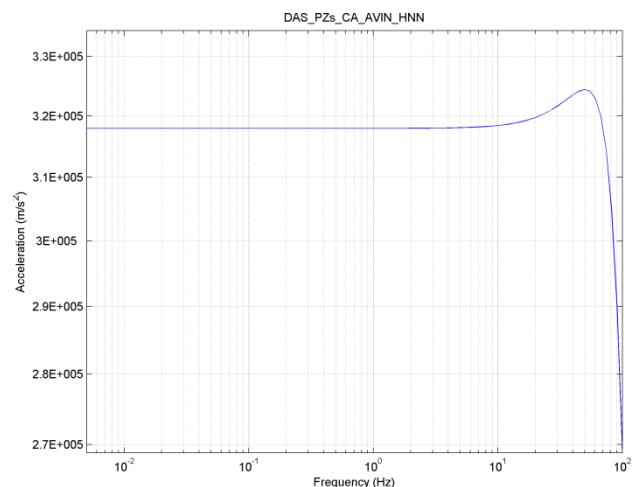
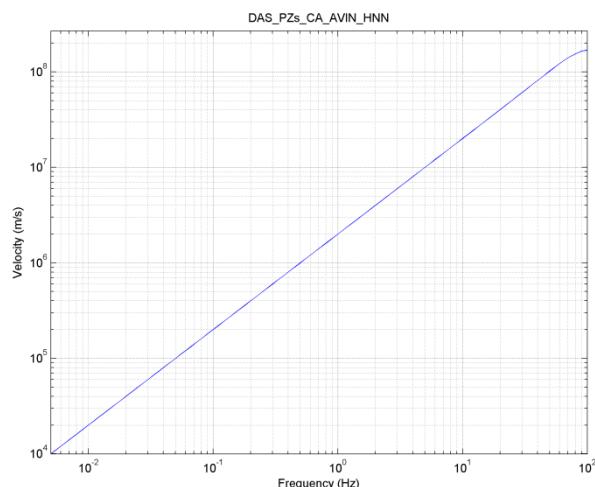
**NSCL code:****CA.AVIN.HNN****Coordinates (ERTS89)**Latitude: **41.843810N**Country: **Spain**Longitude: **1.965460E**Municipality: **Avinyó**Elevation: **334 m**Owner: **IGC****Channel response**

Sensitivity	<b>3.179612E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>200</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.611933E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.AVIN.HNZ****Coordinates (ERTS89)**

Latitude: 41.843810N

Country: Spain

Longitude: 1.965460E

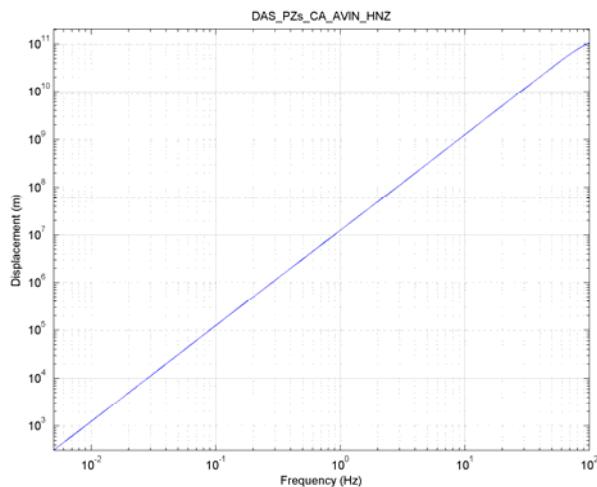
Municipality: Avinyó

Elevation: 334 m

Owner: IGC

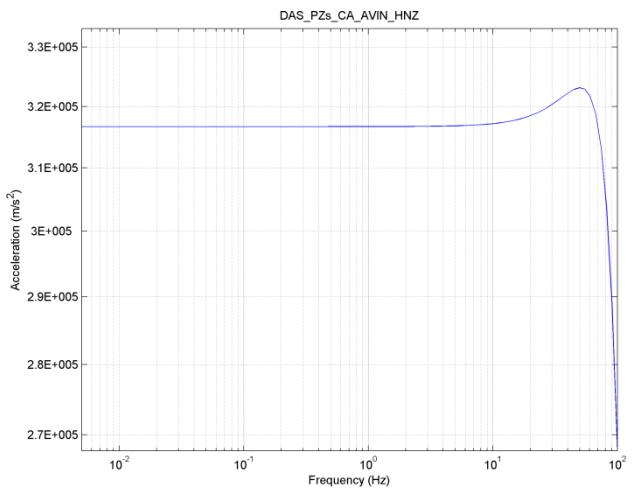
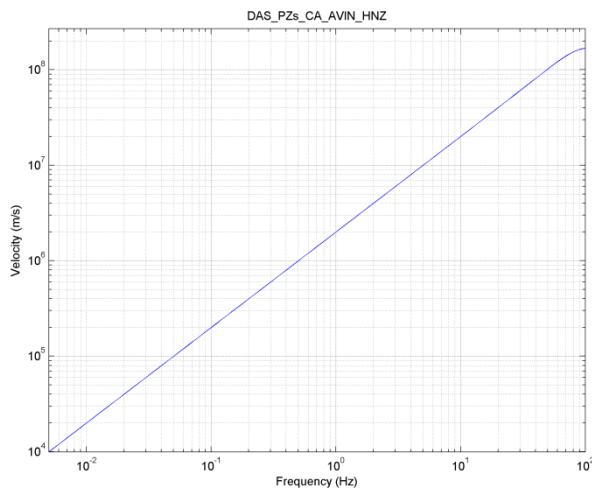
**Channel response**

Sensitivity	3.167033E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.573907E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CARA.HHE****Coordinates (ERTS89)**

Latitude: 42.707643N

Country: Spain

Longitude: 0.818132E

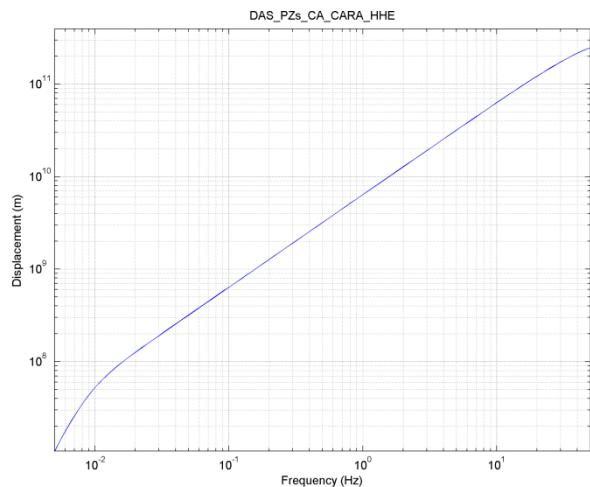
Municipality: Vielha

Elevation: 1627 m

Owner: IGC

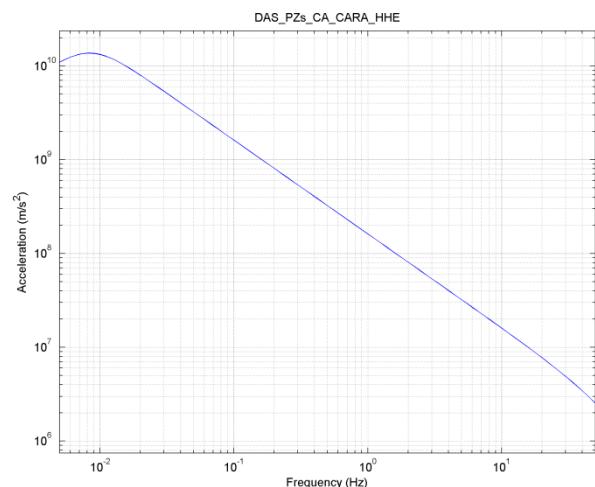
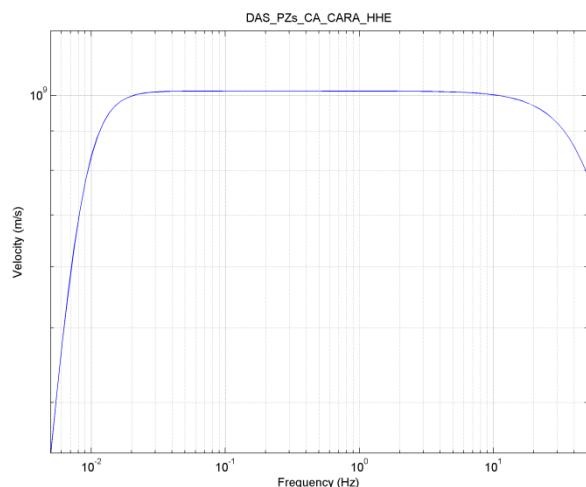
**Channel response**

Sensitivity	1.014672E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.731006E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CARA.HHN****Coordinates (ERTS89)**

Latitude: 42.707643N

Country: Spain

Longitude: 0.818132E

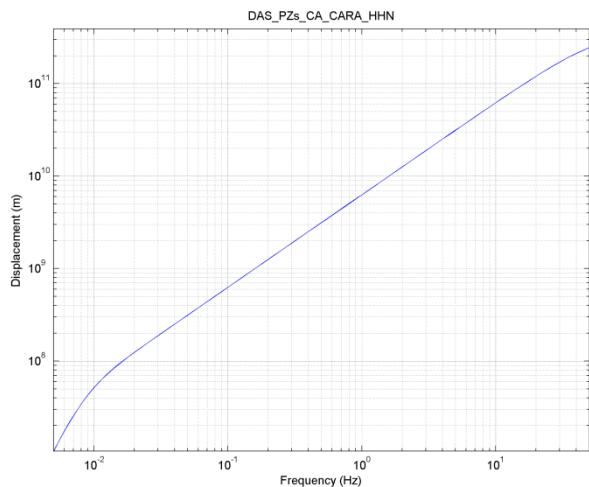
Municipality: Vielha

Elevation: 1627 m

Owner: IGC

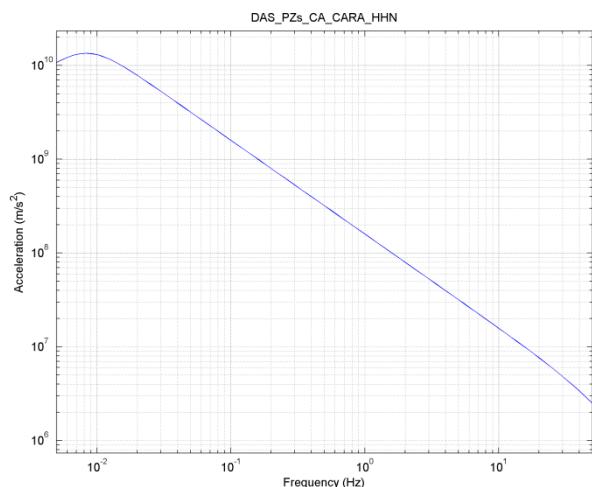
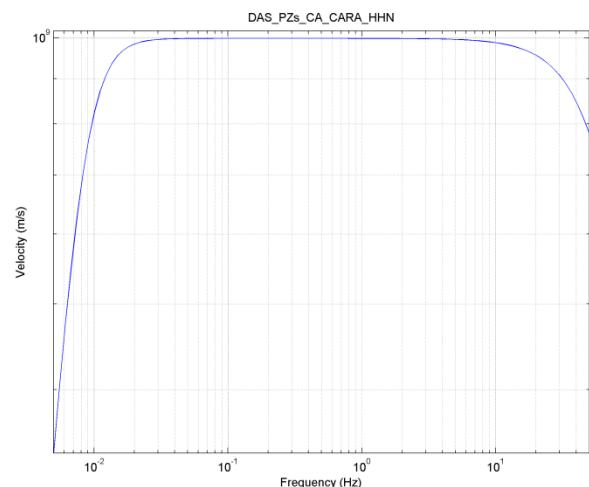
**Channel response**

Sensitivity	1.000005E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.619257E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CARA.HHZ****Coordinates (ERTS89)**

Latitude: 42.707643N

Country: Spain

Longitude: 0.818132E

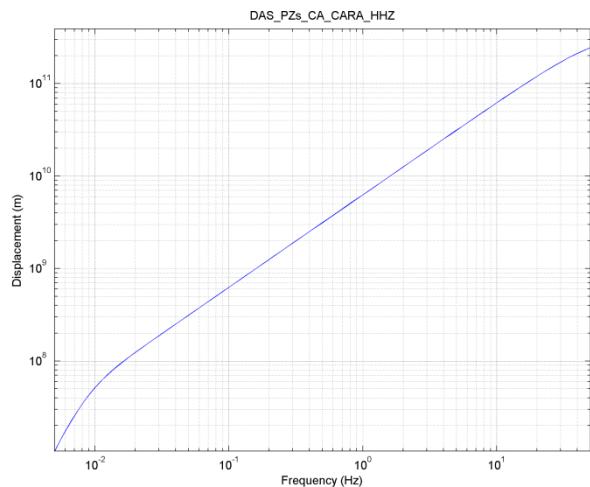
Municipality: Vielha

Elevation: 1627 m

Owner: IGC

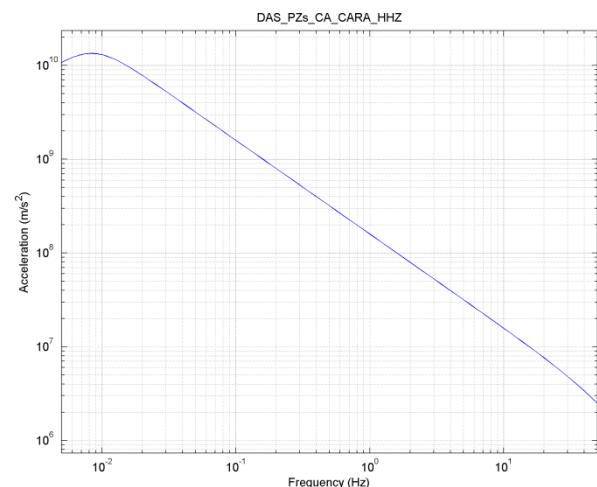
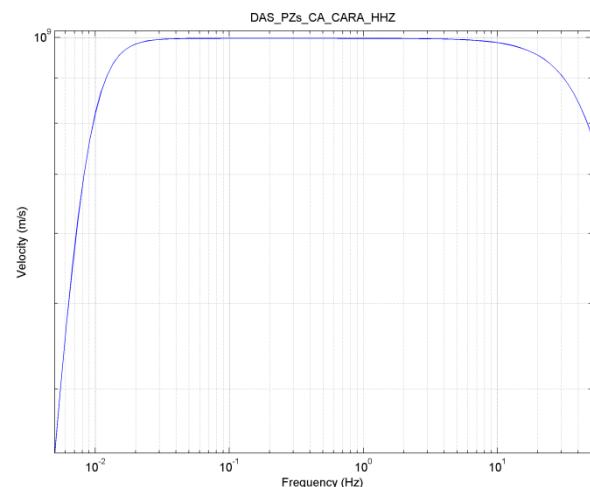
**Channel response**

Sensitivity	9.986717E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.609098E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CAVN.HHE****Coordinates (ERTS89)**

Latitude: 41.881580N

Country: Spain

Longitude: 0.750600E

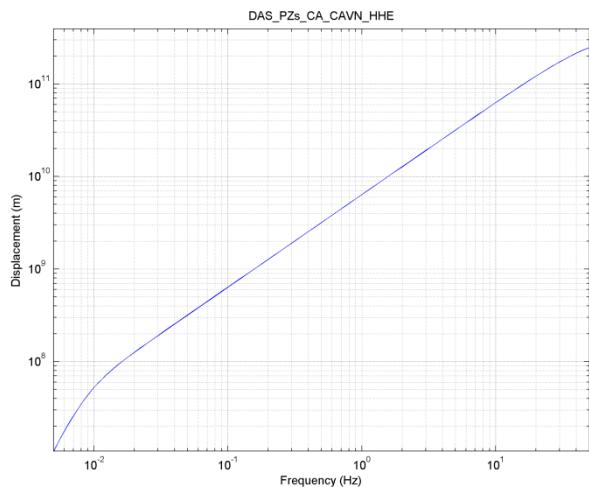
Municipality: Les Avellanes

Elevation: 634 m

Owner: IGC

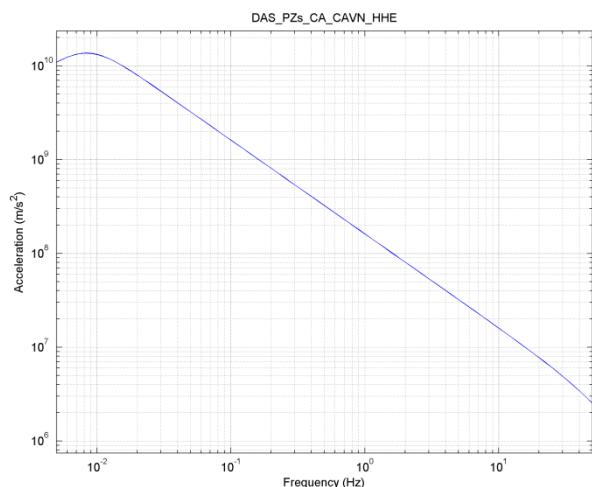
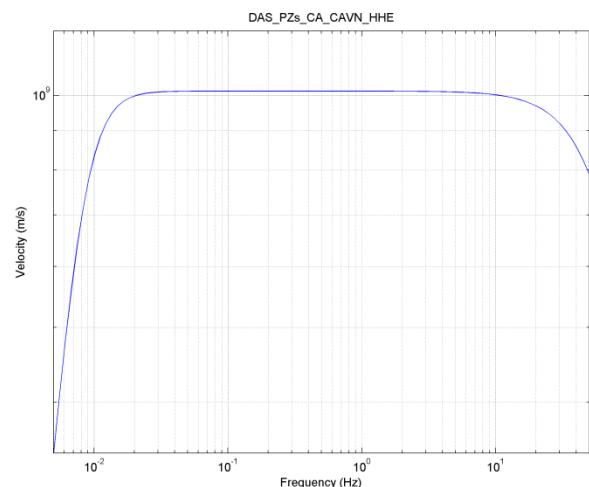
**Channel response**

Sensitivity	1.001980E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 8  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-9904.8000 3786.0000  
-9904.8000 -3786.0000  
-12507.0000 0.0000  
CONSTANT 8.144211E+20

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CAVN.HHN****Coordinates (ERTS89)**

Latitude: 41.881580N

Country: Spain

Longitude: 0.750600E

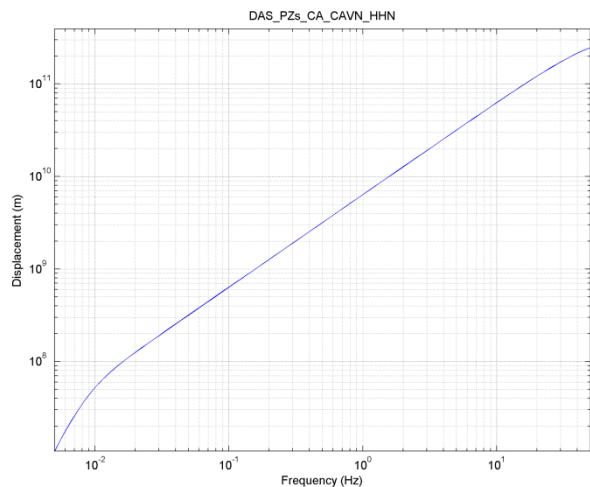
Municipality: Les Avellanes

Elevation: 634 m

Owner: IGC

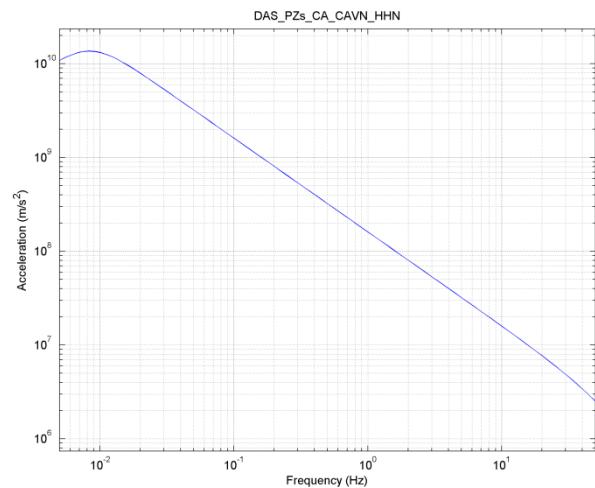
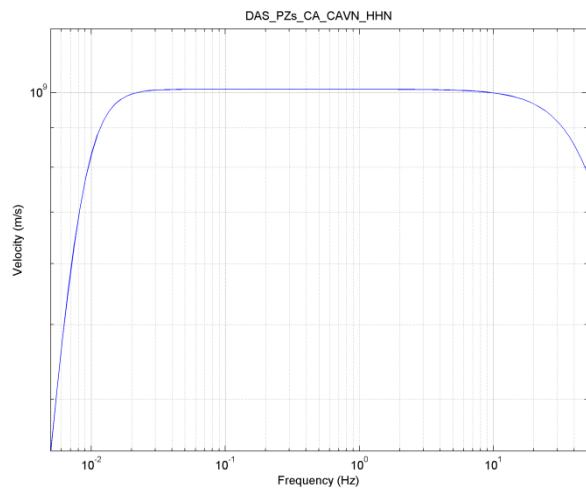
**Channel response**

Sensitivity	9.993150E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 8  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-9904.8000 3786.0000  
-9904.8000 -3786.0000  
-12507.0000 0.0000  
CONSTANT 8.122549E+20

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CAVN.HHZ****Coordinates (ERTS89)**

Latitude: 41.881580N

Country: Spain

Longitude: 0.750600E

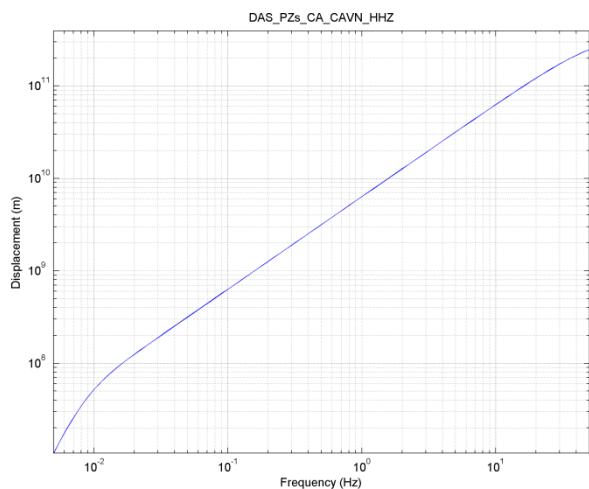
Municipality: Les Avellanes

Elevation: 634 m

Owner: IGC

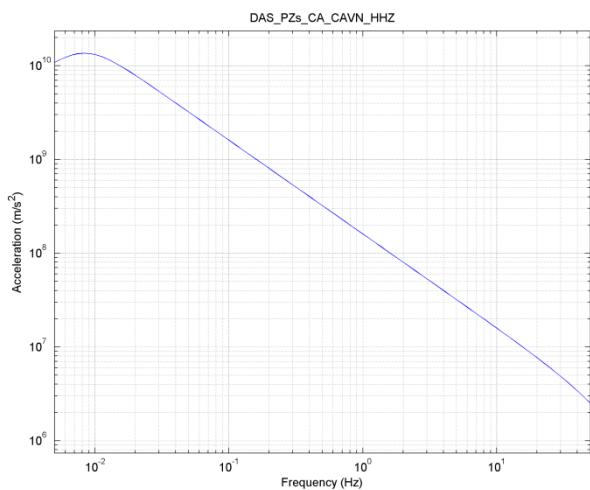
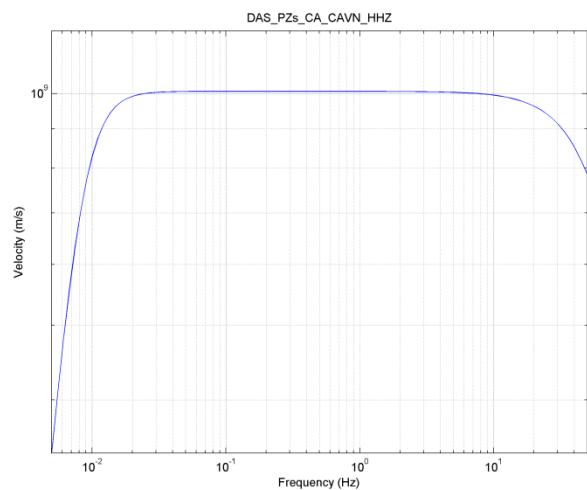
**Channel response**

Sensitivity	9.953180E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 8  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-9904.8000 3786.0000  
-9904.8000 -3786.0000  
-12507.0000 0.0000  
CONSTANT 8.090061E+20

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CBEU.HHE****Coordinates (ERTS89)**

Latitude: 42.255628N

Country: Spain

Longitude: 2.675790E

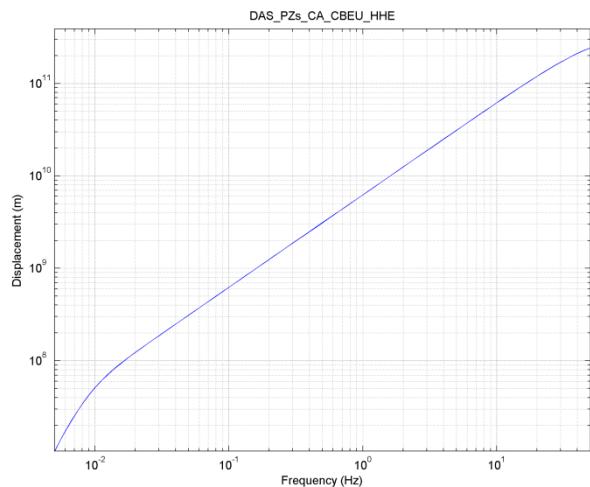
Municipality: Beuda

Elevation: 824 m

Owner: IGC

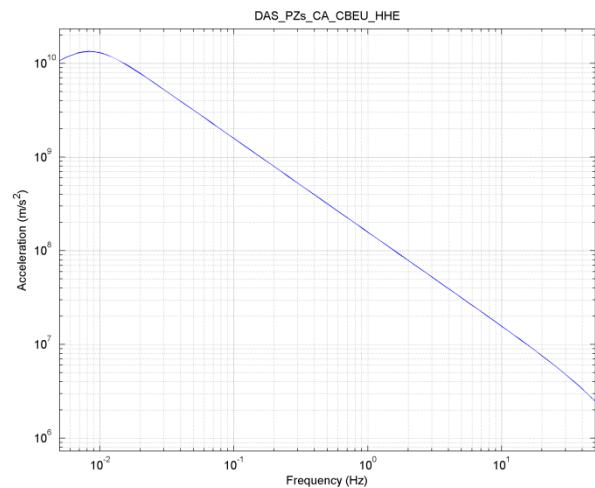
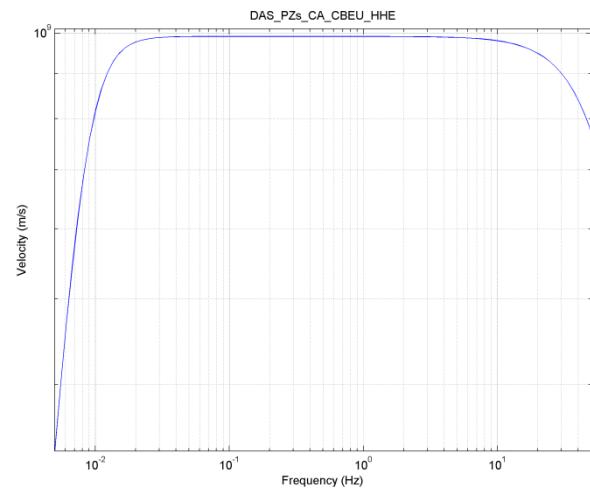
**Channel response**

Sensitivity	9.920000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.557925E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CBEU.HHN****Coordinates (ERTS89)**

Latitude: 42.255628N

Country: Spain

Longitude: 2.675790E

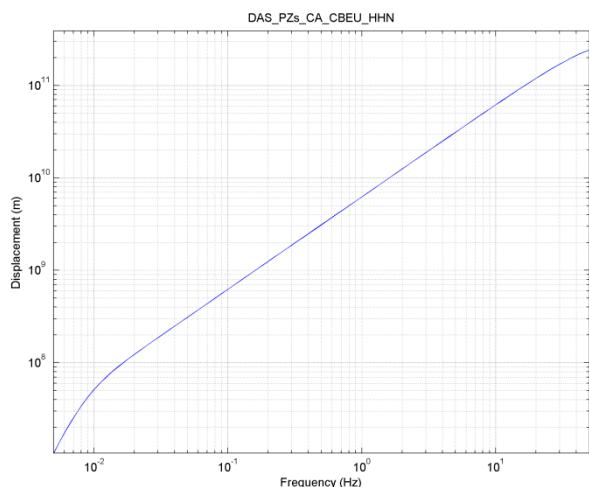
Municipality: Beuda

Elevation: 824 m

Owner: IGC

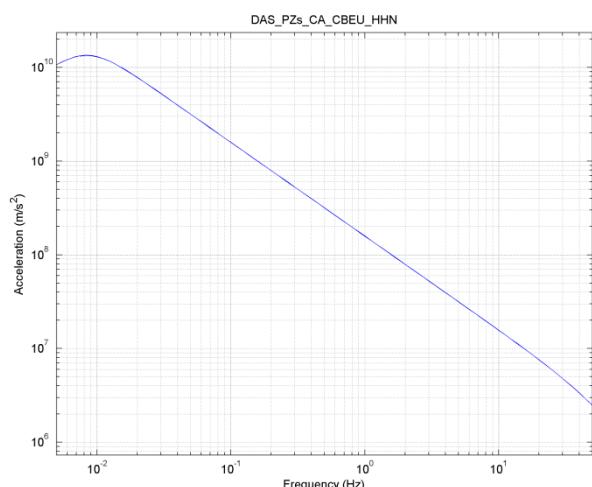
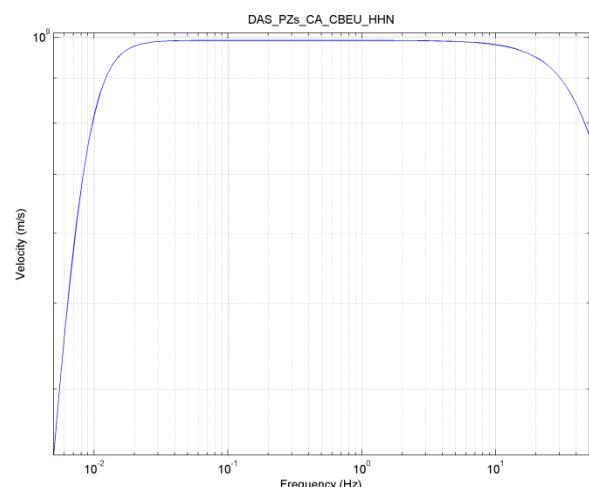
**Channel response**

Sensitivity	9.933330E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.568082E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CBEU.HHZ****Coordinates (ERTS89)**

Latitude: 42.255628N

Country: Spain

Longitude: 2.675790E

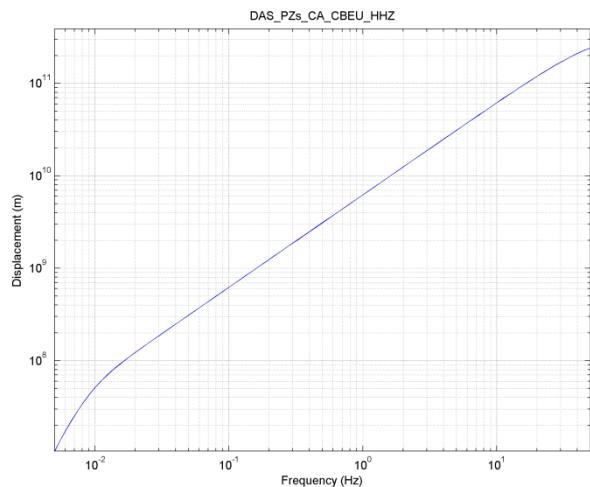
Municipality: Beuda

Elevation: 824 m

Owner: IGC

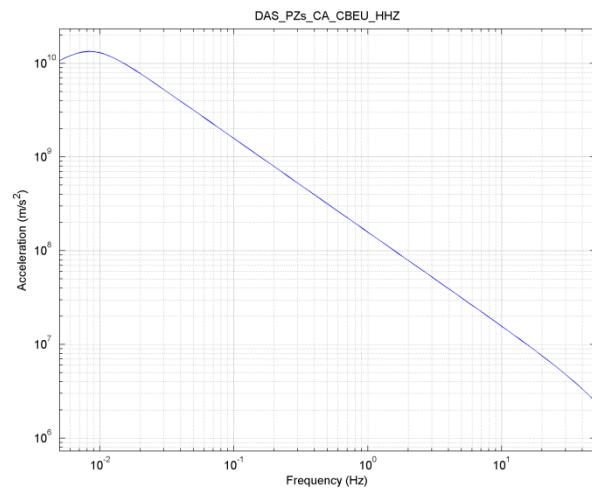
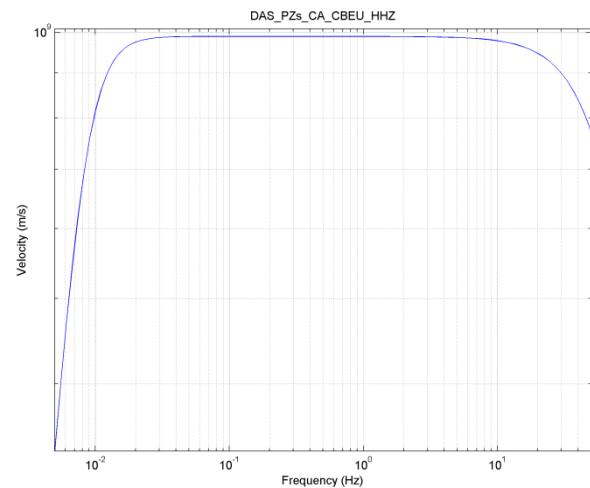
**Channel response**

Sensitivity	9.906670E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.547769E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CBRU.HHE****Coordinates (ERTS89)**

Latitude: 42.284413N

Country: Spain

Longitude: 2.178993E

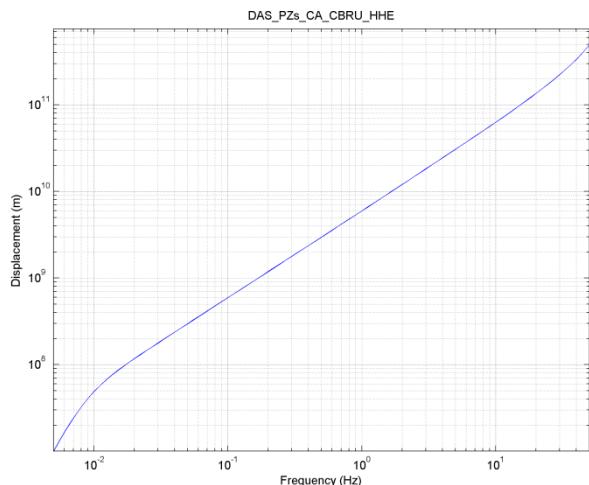
Municipality: Bruguera

Elevation: 1327 m

Owner: IGC

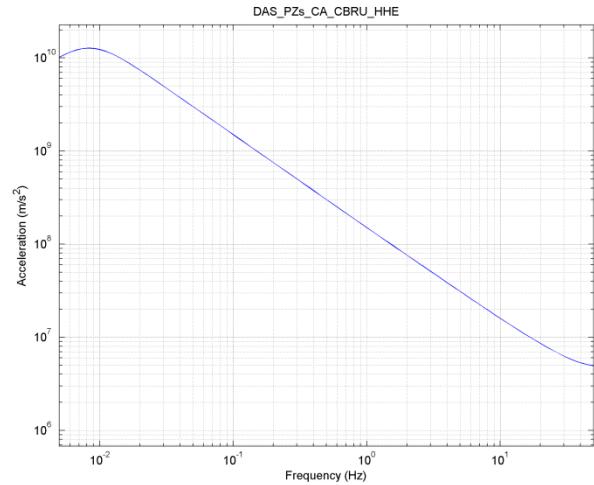
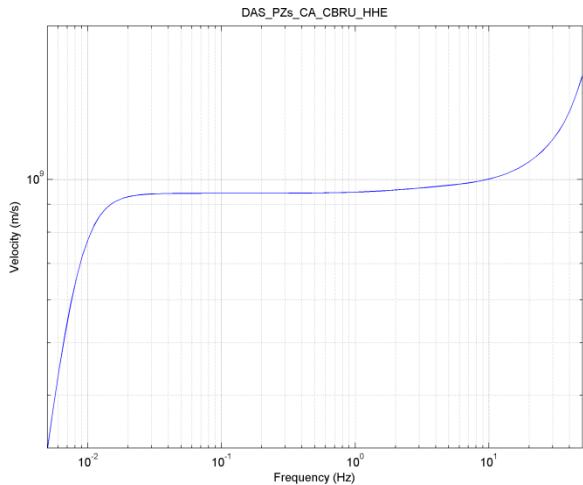
**Channel response**

Sensitivity	1.001514E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 7  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-463.1000 -430.5000  
-463.1000 430.5000  
-176.6000 0.0000  
-15.1500 0.0000  
POLES 14  
-13300.0000 0.0000  
-10530.0000 10050.0000  
-10530.0000 -10050.0000  
-520.3000 0.0000  
-374.8000 0.0000  
-97.3400 -400.7000  
-97.3400 400.7000  
-15.6400 0.0000  
-0.0370 0.0370  
-0.0370 -0.0370  
-255.0970 0.0000  
-9904.8000 3786.0000  
-9904.8000 -3786.0000  
-12507.0000 0.0000  
CONSTANT 4.623364E+29

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CBRU.HHN****Coordinates (ERTS89)**

Latitude: 42.284413N

Country: Spain

Longitude: 2.178993E

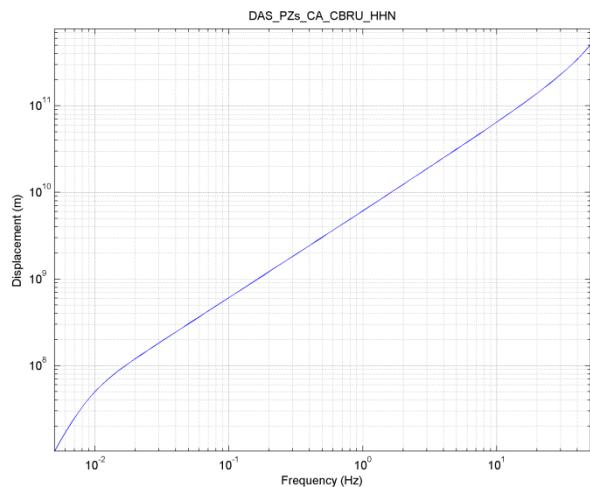
Municipality: Bruguera

Elevation: 1327 m

Owner: IGC

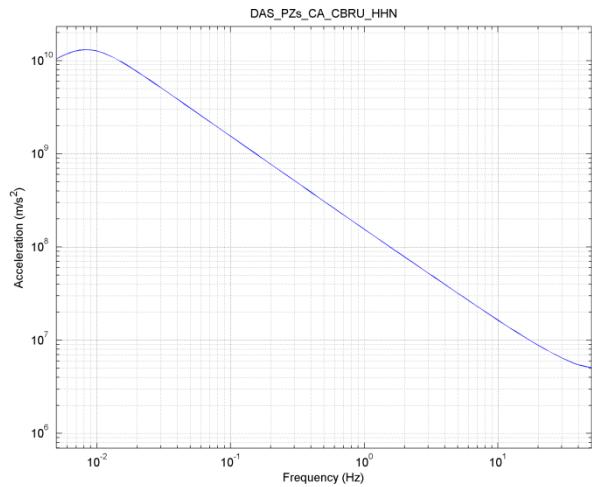
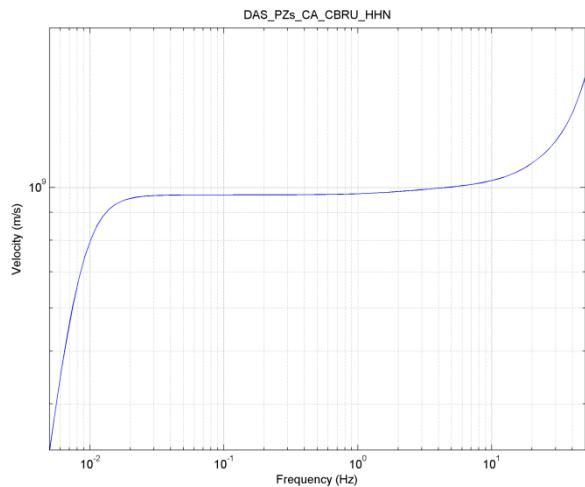
**Channel response**

Sensitivity	1.029894E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 7  
 0.0000 0.0000  
 0.0000 0.0000  
 0.0000 0.0000  
 -463.1000 -430.5000  
 -463.1000 430.5000  
 -176.6000 0.0000  
 -15.1500 0.0000  
 POLES 14  
 -13300.0000 0.0000  
 -10530.0000 10050.0000  
 -10530.0000 -10050.0000  
 -520.3000 0.0000  
 -374.8000 0.0000  
 -97.3400 -400.7000  
 -97.3400 400.7000  
 -15.6400 0.0000  
 -0.0370 0.0370  
 -0.0370 -0.0370  
 -255.0970 0.0000  
 -9904.8000 3786.0000  
 -9904.8000 -3786.0000  
 -12507.0000 0.0000  
 CONSTANT 4.751146E+29

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CBRU.HHZ****Coordinates (ERTS89)**

Latitude: 42.284413N

Country: Spain

Longitude: 2.178993E

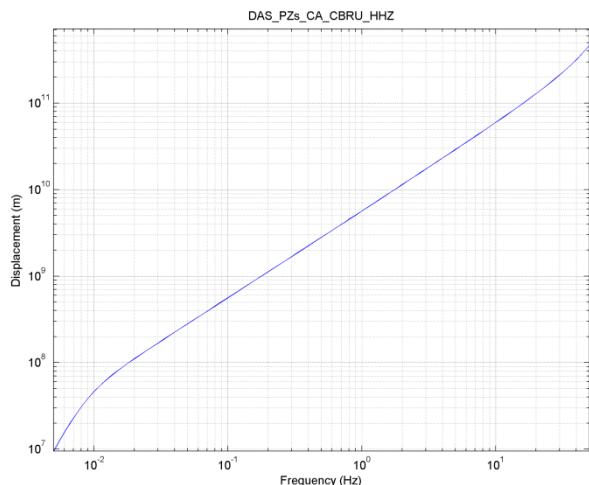
Municipality: Bruguera

Elevation: 1327 m

Owner: IGC

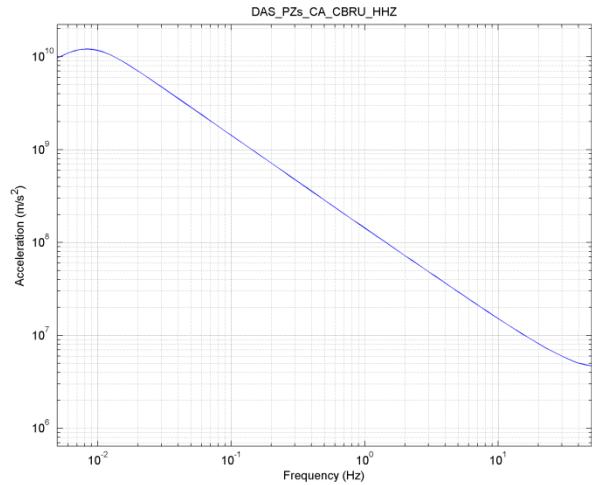
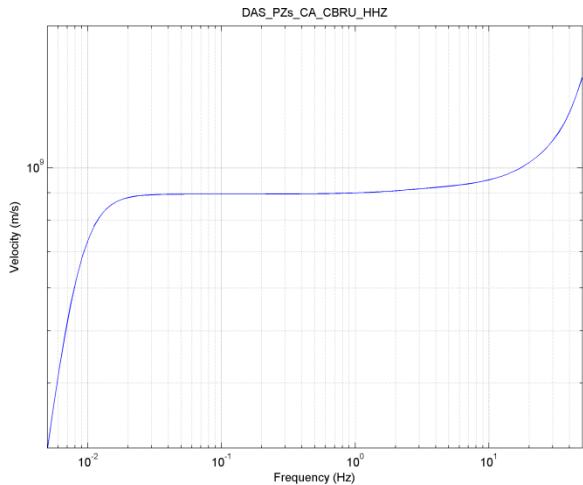
**Channel response**

Sensitivity	9.508150E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 7  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-463.1000 -430.5000  
-463.1000 430.5000  
-176.6000 0.0000  
-15.1500 0.0000  
POLES 14  
-13300.0000 0.0000  
-10530.0000 10050.0000  
-10530.0000 -10050.0000  
-520.3000 0.0000  
-374.8000 0.0000  
-97.3400 -400.7000  
-97.3400 400.7000  
-15.6400 0.0000  
-0.0370 0.0370  
-0.0370 -0.0370  
-255.0970 0.0000  
-9904.8000 3786.0000  
-9904.8000 -3786.0000  
-12507.0000 0.0000  
CONSTANT 4.386335E+29

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CCAS.HHE****Coordinates (ERTS89)**

Latitude: 41.882878N

Country: Spain

Longitude: 2.904135E

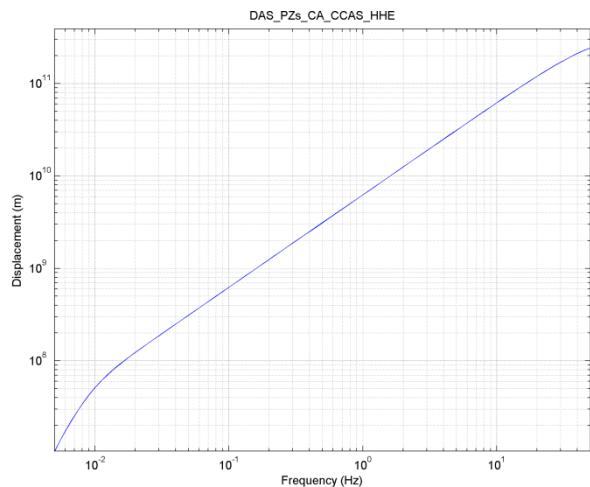
Municipality: Cassà de la Selva

Elevation: 197 m

Owner: IGC

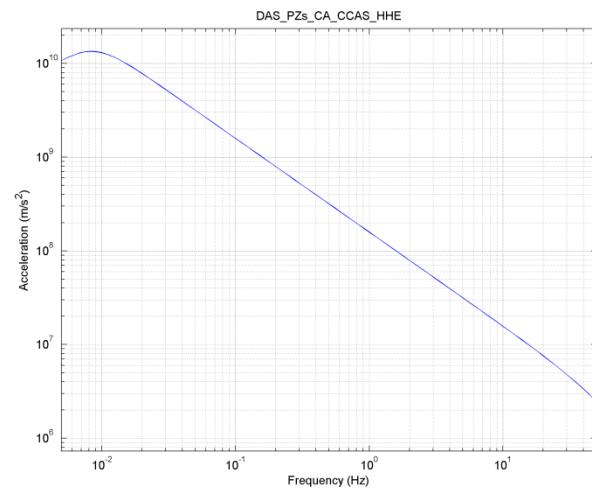
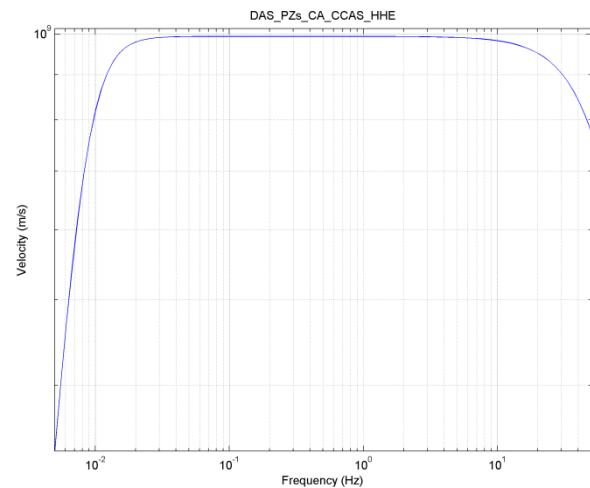
**Channel response**

Sensitivity	9.946670E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.578245E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CCAS.HHN****Coordinates (ERTS89)**

Latitude: 41.882878N

Country: Spain

Longitude: 2.904135E

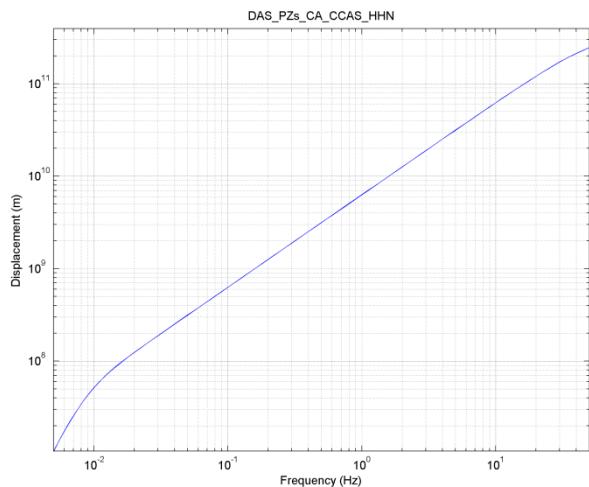
Municipality: Cassà de la Selva

Elevation: 197 m

Owner: IGC

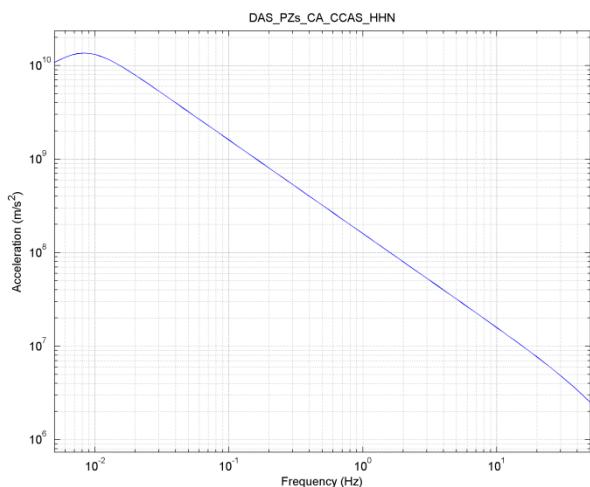
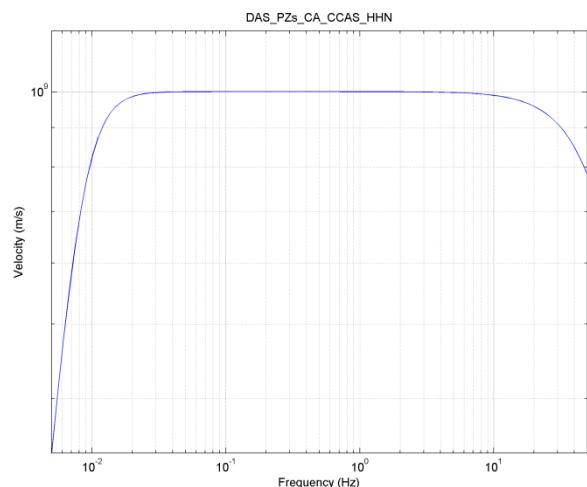
**Channel response**

Sensitivity	1.002670E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.639219E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CCAS.HHZ****Coordinates (ERTS89)**

Latitude: 41.882878N

Country: Spain

Longitude: 2.904135E

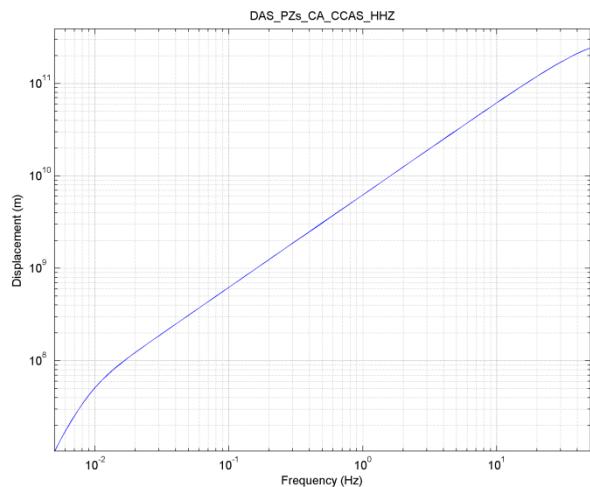
Municipality: Cassà de la Selva

Elevation: 197 m

Owner: IGC

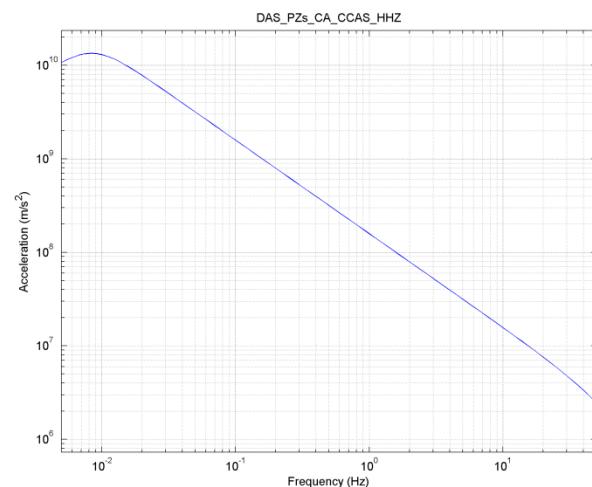
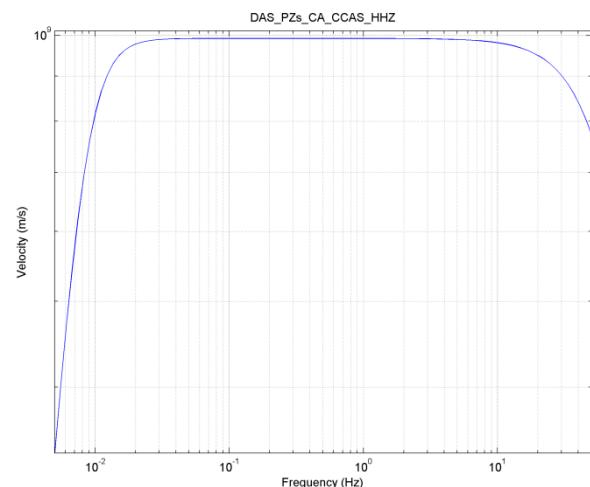
**Channel response**

Sensitivity	9.933330E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.568082E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CELS.HNE****Coordinates (ERTS89)**

Latitude: 41.689600N

Country: Spain

Longitude: 2.492300E

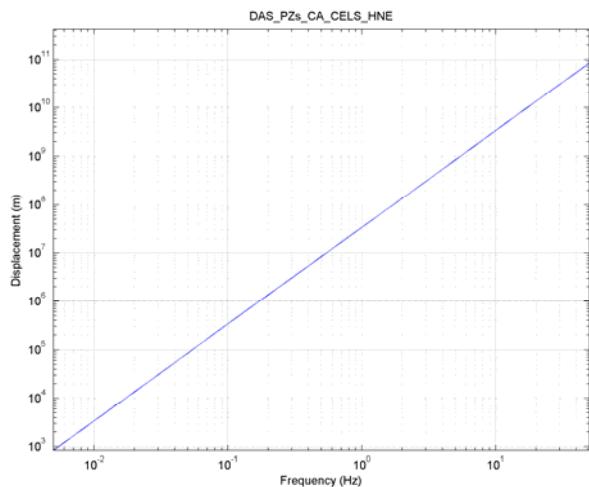
Municipality: Sant Celoni

Elevation: 150 m

Owner: IGC

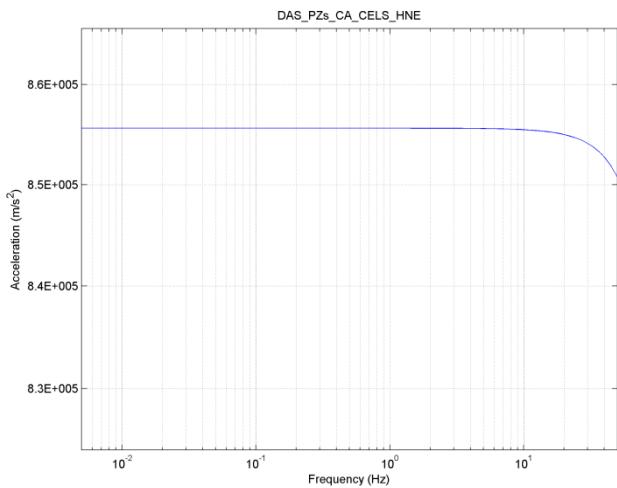
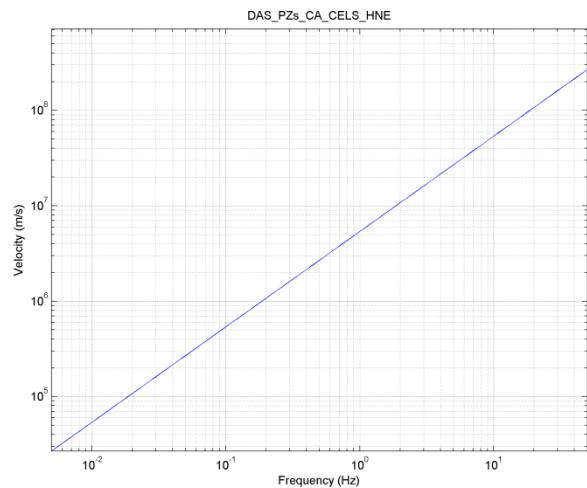
**Channel response**

Sensitivity	8.556380E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	100



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 -1009.0000  
-981.0000 1009.0000  
-3290.0000 -1263.0000  
-3290.0000 1263.0000  
CONSTANT 2.104498E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CELS.HNN****Coordinates (ERTS89)**

Latitude: 41.689600N

Country: Spain

Longitude: 2.492300E

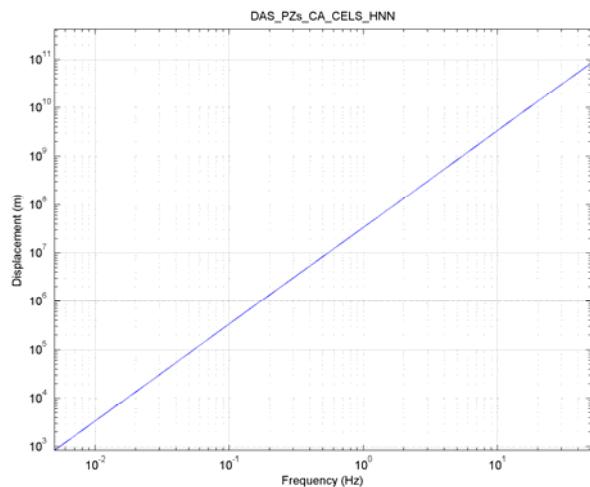
Municipality: Sant Celoni

Elevation: 150 m

Owner: IGC

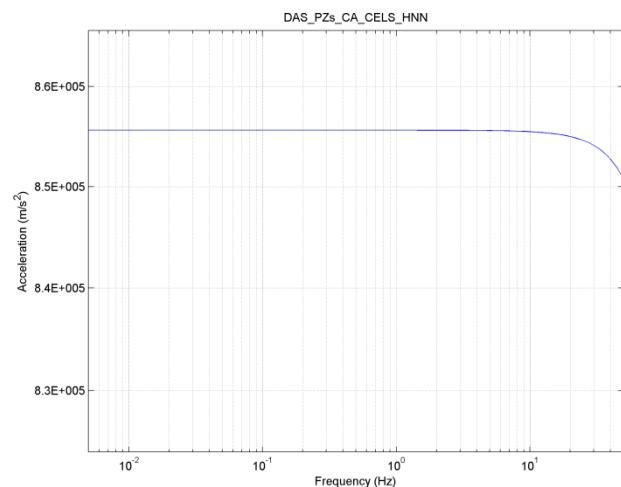
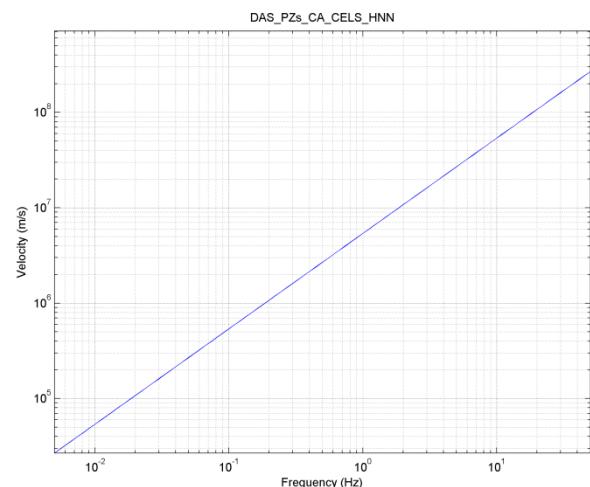
**Channel response**

Sensitivity	8.556380E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	100



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 -1009.0000  
-981.0000 1009.0000  
-3290.0000 -1263.0000  
-3290.0000 1263.0000  
CONSTANT 2.104498E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CELS.HNZ****Coordinates (ERTS89)**

Latitude: 41.689600N

Country: Spain

Longitude: 2.492300E

Municipality: Sant Celoni

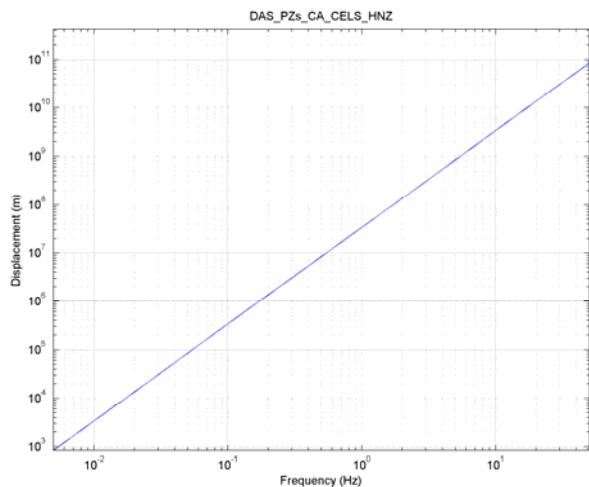
Elevation: 150 m

Owner: IGC

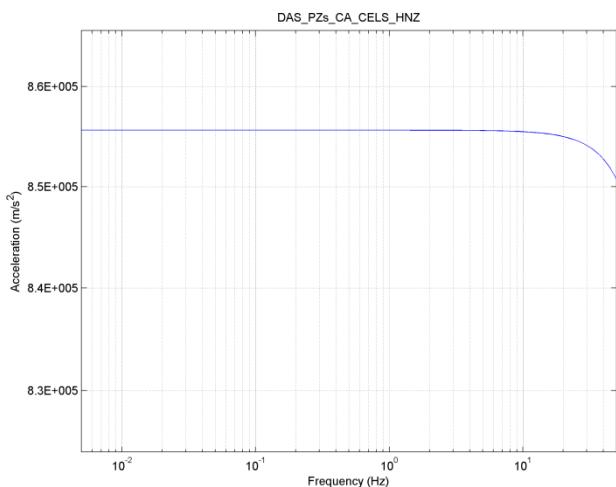
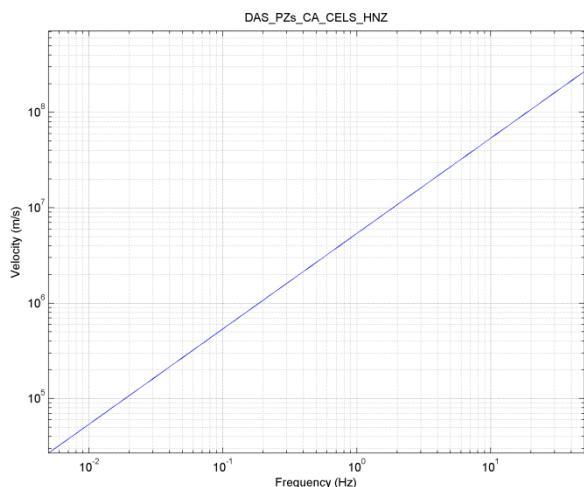
**Channel response**

Sensitivity	8.556380E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	100

ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 -1009.0000  
-981.0000 1009.0000  
-3290.0000 -1263.0000  
-3290.0000 1263.0000  
CONSTANT 2.104498E+10



Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CEST.HHE****Coordinates (ERTS89)**

Latitude: 42.598657N

Country: Spain

Longitude: 1.254057E

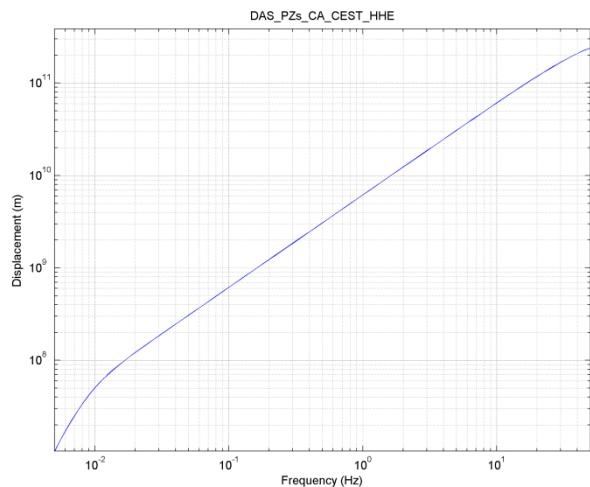
Municipality: Esterri de Cardòs

Elevation: 1325 m

Owner: IGC

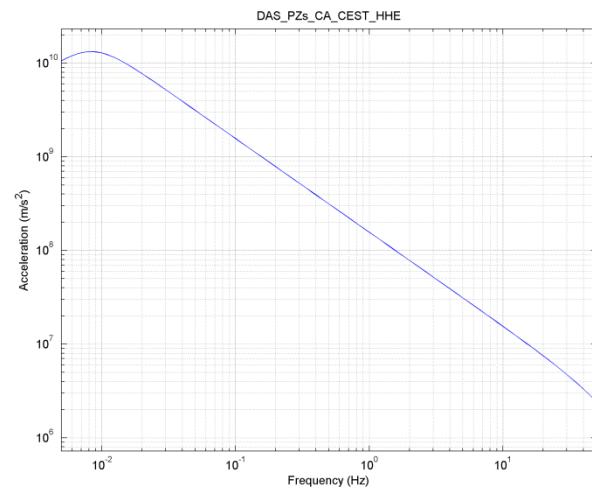
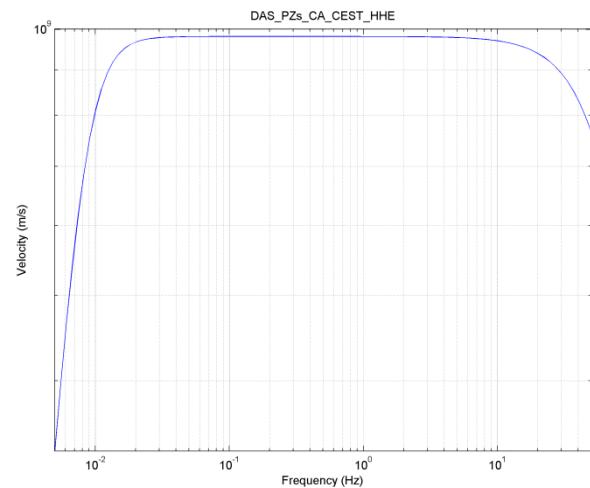
**Channel response**

Sensitivity	9.826670E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.486818E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CEST.HHN****Coordinates (ERTS89)**

Latitude: 42.598657N

Country: Spain

Longitude: 1.254057E

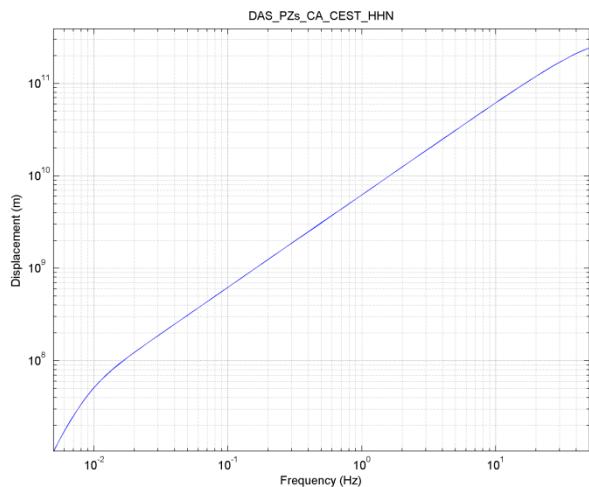
Municipality: Esterri de Cardòs

Elevation: 1325 m

Owner: IGC

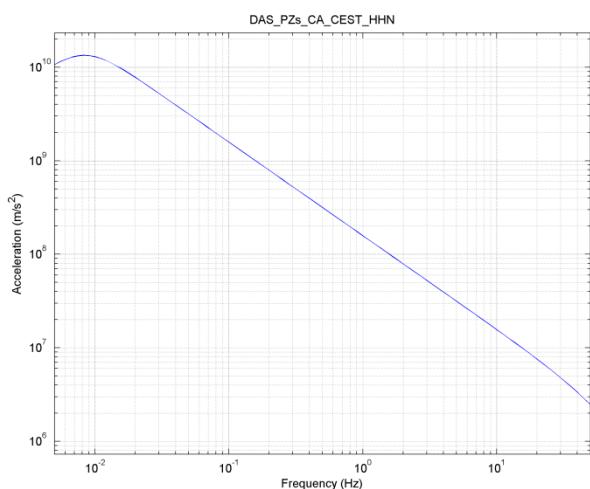
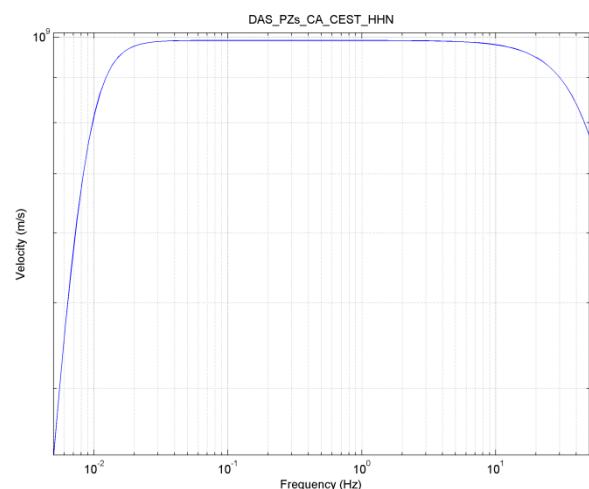
**Channel response**

Sensitivity	9.920000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.557925E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CEST.HHZ****Coordinates (ERTS89)**

Latitude: 42.598657N

Country: Spain

Longitude: 1.254057E

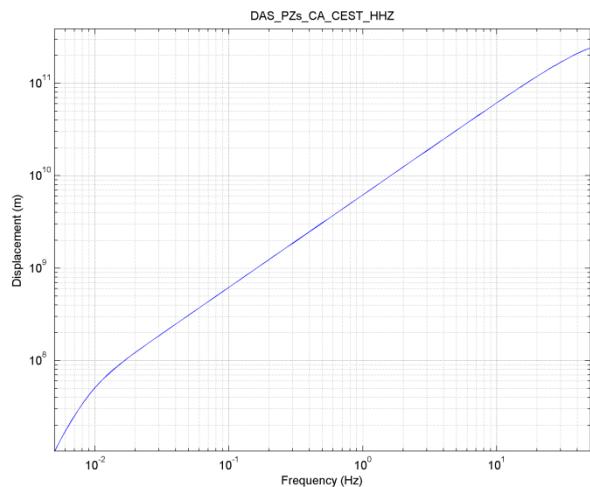
Municipality: Esterri de Cardòs

Elevation: 1325 m

Owner: IGC

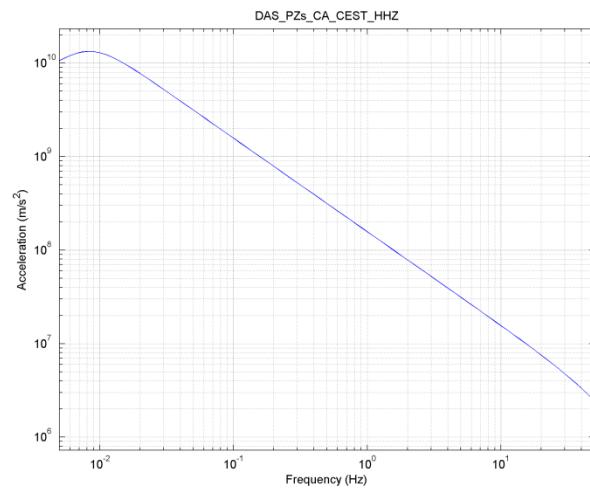
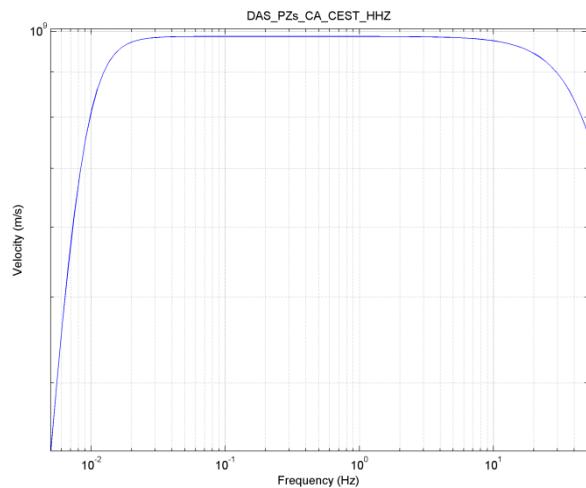
**Channel response**

Sensitivity	9.880000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.527450E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CFON.HHE****Coordinates (ERTS89)**

Latitude: 42.761172N

Country: Spain

Longitude: 2.434567E

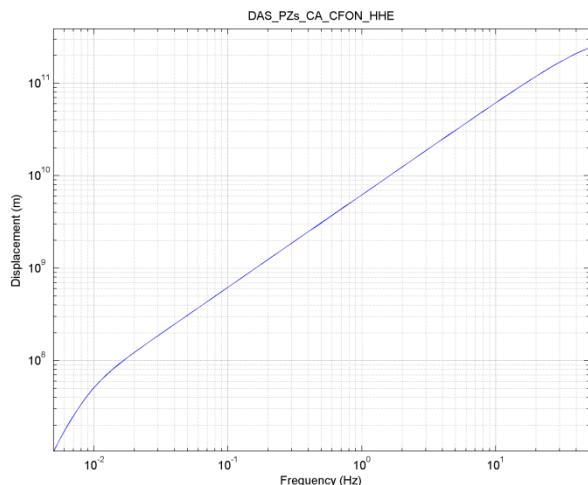
Municipality: Fogars de Montclús

Elevation: 973 m

Owner: IGC

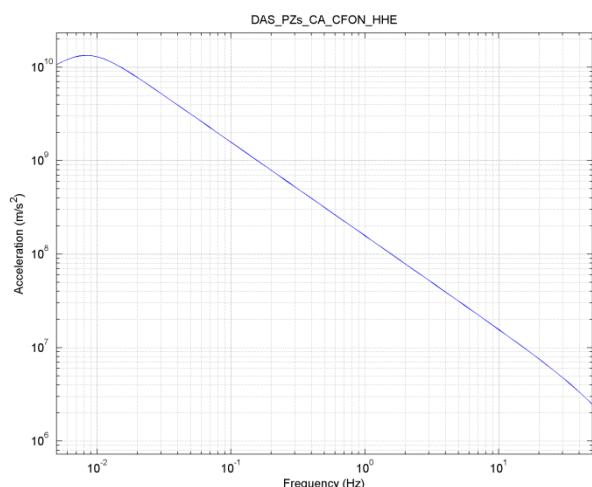
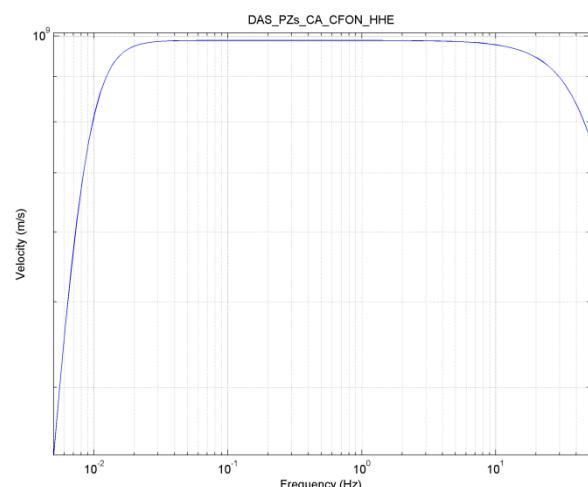
**Channel response**

Sensitivity	9.993150E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



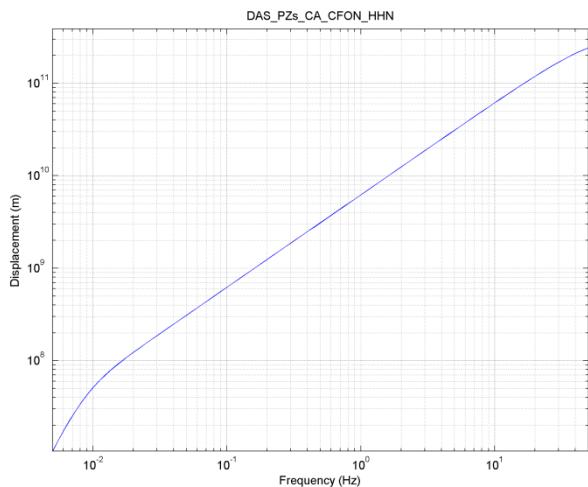
ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 8  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-9904.8000 3786.0000  
-9904.8000 -3786.0000  
-12507.0000 0.0000  
CONSTANT 7.946969E+20

Amplitudes in nm and poles and zeros in rad/s



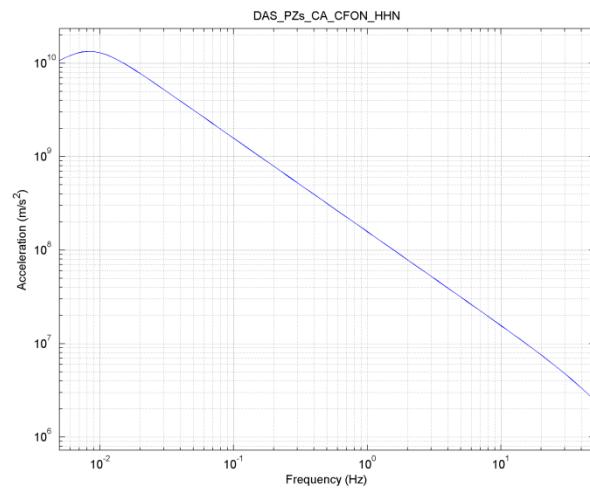
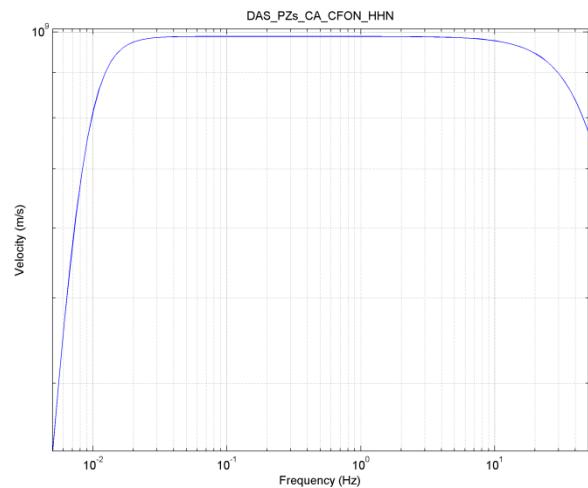
**NSCL code:****CA.CFON.HHN****Coordinates (ERTS89)**Latitude: **42.761172N**Country: **Spain**Longitude: **2.434567E**Municipality: **Fogars de Montclús**Elevation: **973 m**Owner: **IGC****Channel response**

Sensitivity	<b>1.003310E+09</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 8  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-9904.8000 3786.0000  
-9904.8000 -3786.0000  
-12507.0000 0.0000  
CONSTANT 7.946792E+20

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CFON.HHZ****Coordinates (ERTS89)**

Latitude: 42.761172N

Country: Spain

Longitude: 2.434567E

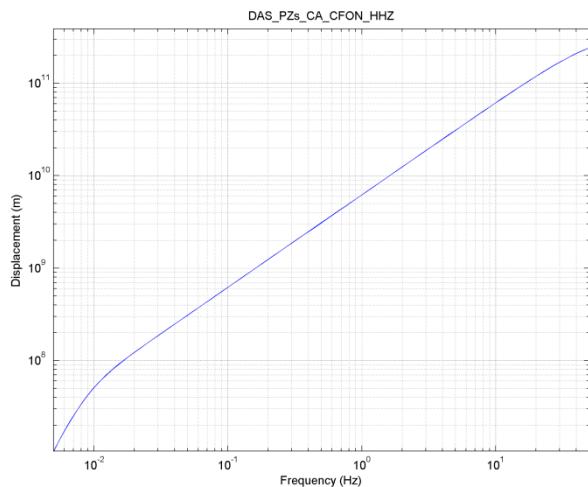
Municipality: Fogars de Montclús

Elevation: 973 m

Owner: IGC

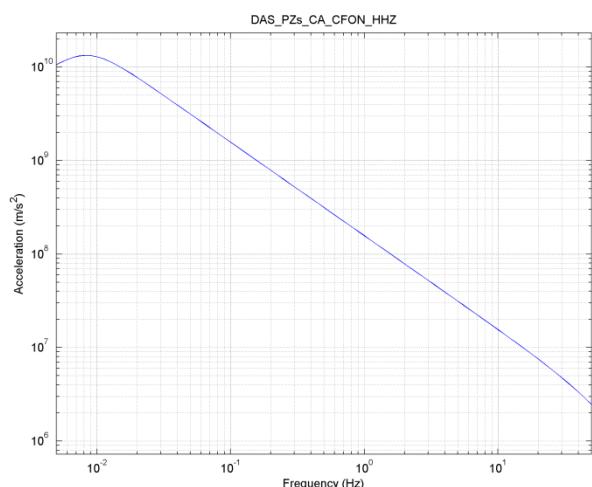
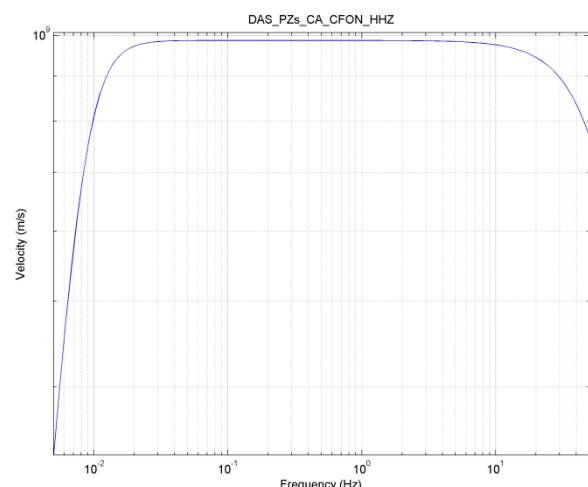
**Channel response**

Sensitivity	9.926530E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



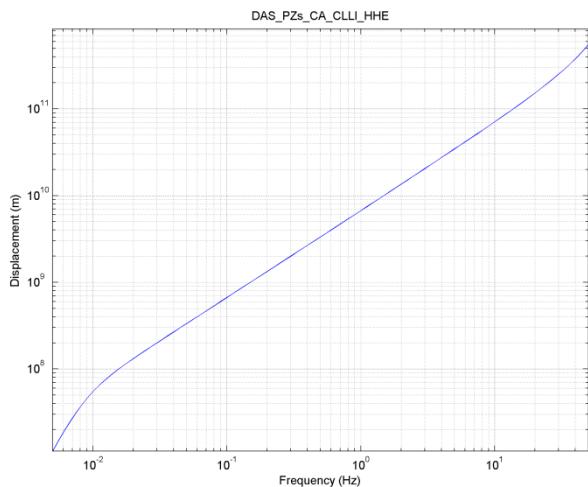
ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 8  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-9904.8000 3786.0000  
-9904.8000 -3786.0000  
-12507.0000 0.0000  
CONSTANT 7.936259E+20

Amplitudes in nm and poles and zeros in rad/s



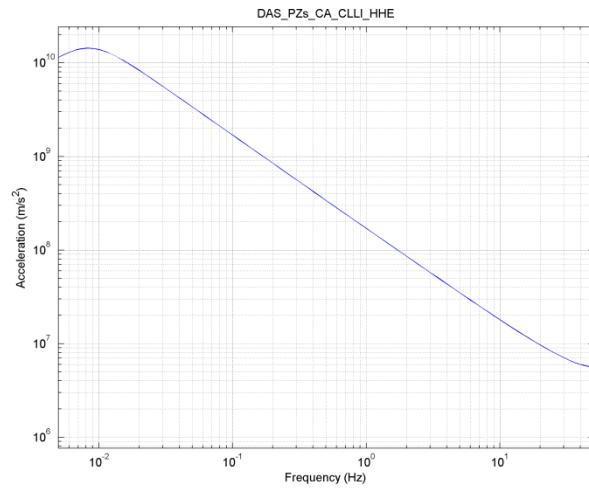
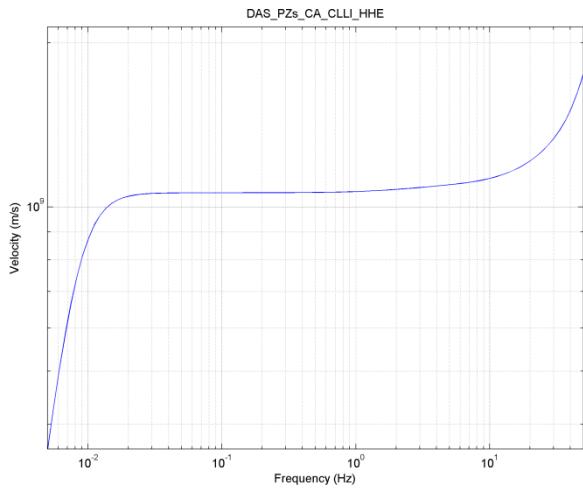
**NSCL code:****CA.CLLI.HHE****Coordinates (ERTS89)**Latitude: **42.478108N**Country: **Spain**Longitude: **1.972967E**Municipality: **Llívia**Elevation: **1413 m**Owner: **IGC****Channel response**

Sensitivity	<b>1.062670E+09</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 7  
 0.0000 0.0000  
 0.0000 0.0000  
 0.0000 0.0000  
 -463.1000 -430.5000  
 -463.1000 430.5000  
 -176.6000 0.0000  
 -15.1500 0.0000  
 POLES 12  
 -13300.0000 0.0000  
 -10530.0000 10050.0000  
 -10530.0000 -10050.0000  
 -520.3000 0.0000  
 -374.8000 0.0000  
 -97.3400 -400.7000  
 -97.3400 400.7000  
 -15.6400 0.0000  
 -0.0370 0.0370  
 -0.0370 -0.0370  
 -255.0970 0.0000  
 -13338.9000 0.0000  
**CONSTANT 4.936758E+21**

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CLLI.HHN****Coordinates (ERTS89)**

Latitude: 42.478108N

Country: Spain

Longitude: 1.972967E

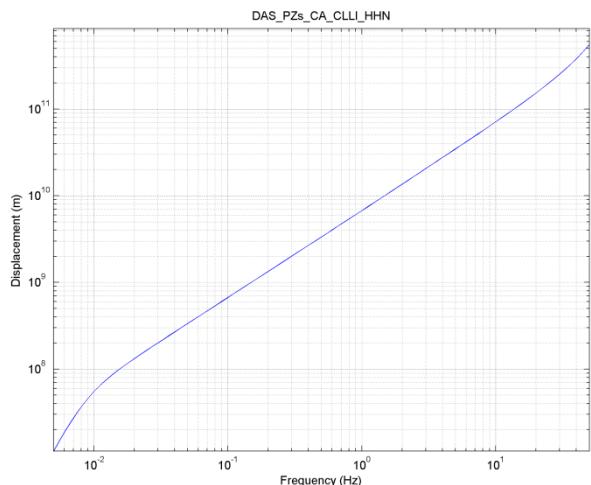
Municipality: Llívia

Elevation: 1413 m

Owner: IGC

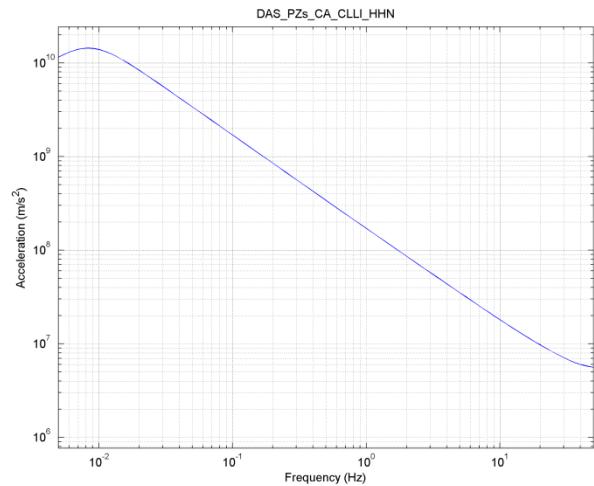
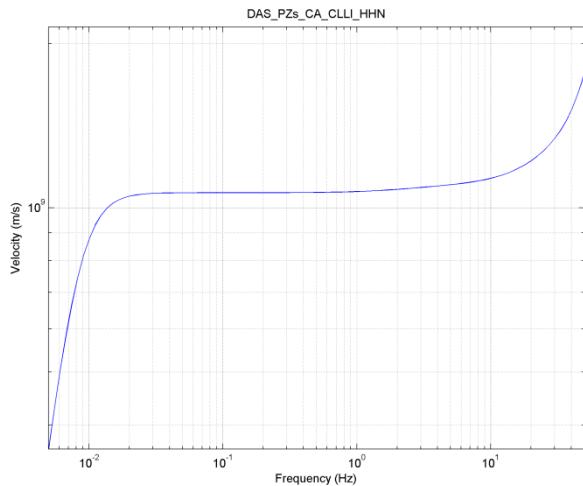
**Channel response**

Sensitivity	1.066670E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



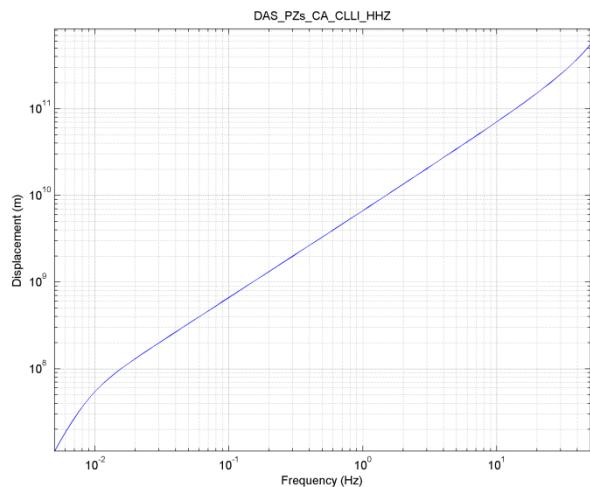
ZEROS 7  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-463.1000 -430.5000  
-463.1000 430.5000  
-176.6000 0.0000  
-15.1500 0.0000  
POLES 12  
-13300.0000 0.0000  
-10530.0000 10050.0000  
-10530.0000 -10050.0000  
-520.3000 0.0000  
374.8000 0.0000  
-97.3400 -400.7000  
-97.3400 400.7000  
-15.6400 0.0000  
-0.0370 0.0370  
-0.0370 -0.0370  
-255.0970 0.0000  
-13338.9000 0.0000  
CONSTANT 4.955340E+21

Amplitudes in nm and poles and zeros in rad/s



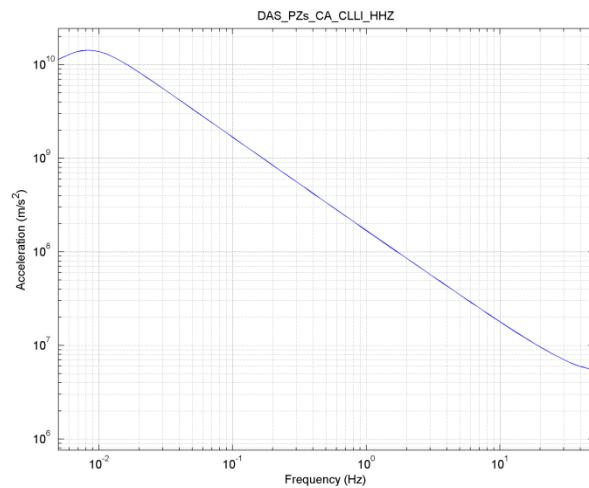
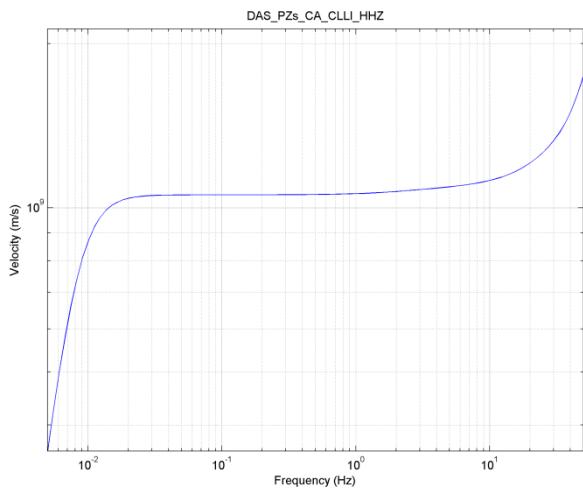
**NSCL code:****CA.CLLI.HHZ****Coordinates (ERTS89)**Latitude: **42.478108N**Country: **Spain**Longitude: **1.972967E**Municipality: **Llívia**Elevation: **1413 m**Owner: **IGC****Channel response**

Sensitivity	<b>1.057330E+09</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 7  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-463.1000 -430.5000  
-463.1000 430.5000  
-176.6000 0.0000  
-15.1500 0.0000  
POLES 12  
-13300.0000 0.0000  
-10530.0000 10050.0000  
-10530.0000 -10050.0000  
-520.3000 0.0000  
-374.8000 0.0000  
-97.3400 -400.7000  
-97.3400 400.7000  
-15.6400 0.0000  
-0.0370 0.0370  
-0.0370 -0.0370  
-255.0970 0.0000  
-13338.9000 0.0000  
CONSTANT 4.911950E+21

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CORG.HHE****Coordinates (ERTS89)**

Latitude: 42.229097N

Country: Spain

Longitude: 1.316527E

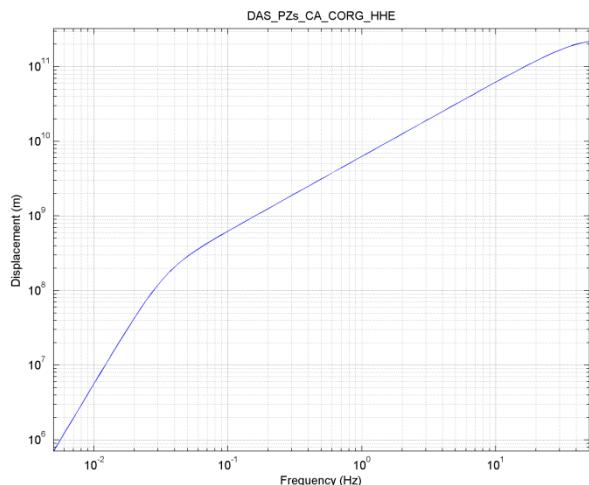
Municipality: Organyà

Elevation: 716 m

Owner: IGC

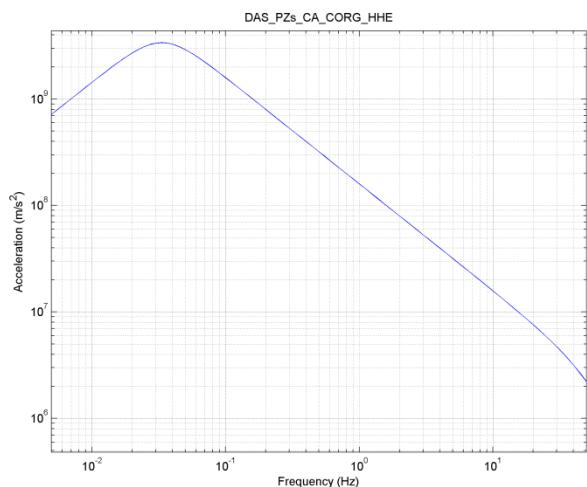
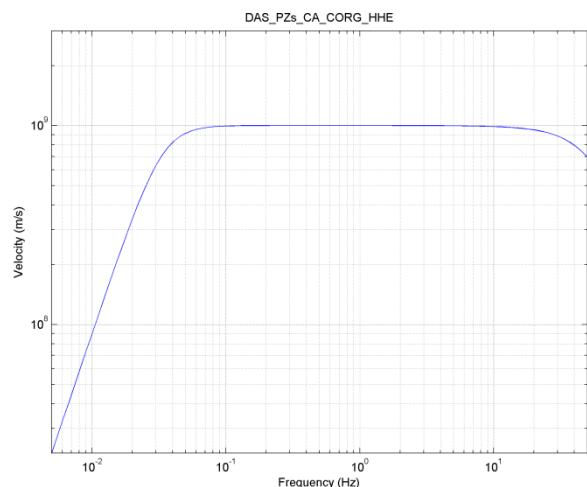
**Channel response**

Sensitivity	9.979500E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 5  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
867.0800 904.7790  
867.0800 -904.7790  
POLES 5  
-0.1480 0.1480  
-0.1480 -0.1480  
-314.1590 202.3190  
-314.1590 -202.3190  
-13338.9000 0.0000  
CONSTANT 1.188196E+03

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CORG.HHN****Coordinates (ERTS89)**

Latitude: 42.229097N

Country: Spain

Longitude: 1.316527E

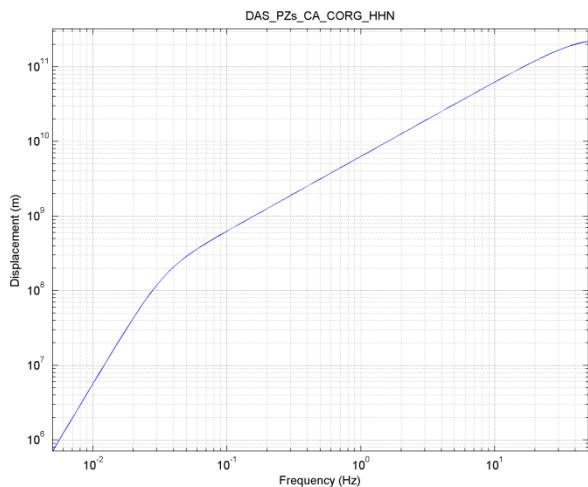
Municipality: Organyà

Elevation: 716 m

Owner: IGC

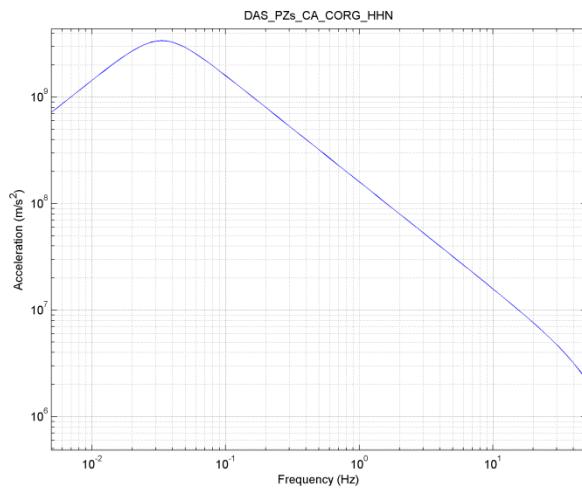
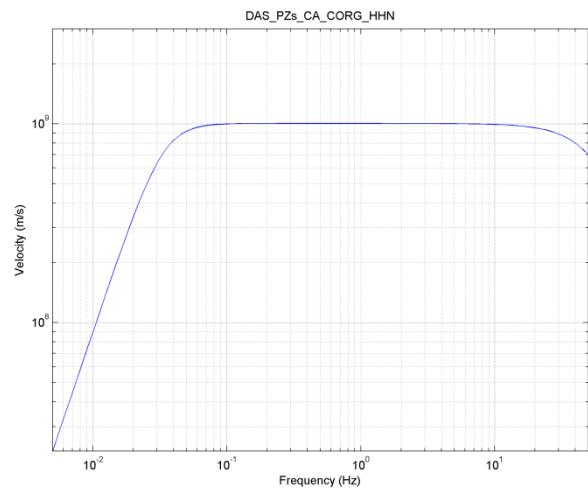
**Channel response**

Sensitivity	1.000950E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 5  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
867.0800 904.7790  
867.0800 -904.7790  
POLES 5  
-0.1480 0.1480  
-0.1480 -0.1480  
-314.1590 202.3190  
-314.1590 -202.3190  
-13338.9000 0.0000  
CONSTANT 1.191768E+03

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CORG.HHZ****Coordinates (ERTS89)**

Latitude: 42.229097N

Country: Spain

Longitude: 1.316527E

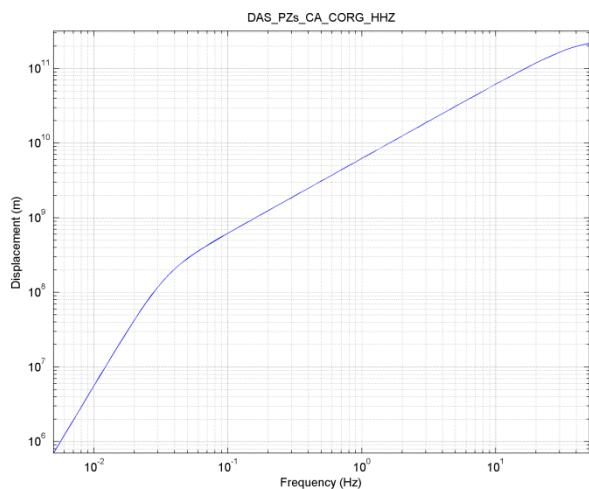
Municipality: Organyà

Elevation: 716 m

Owner: IGC

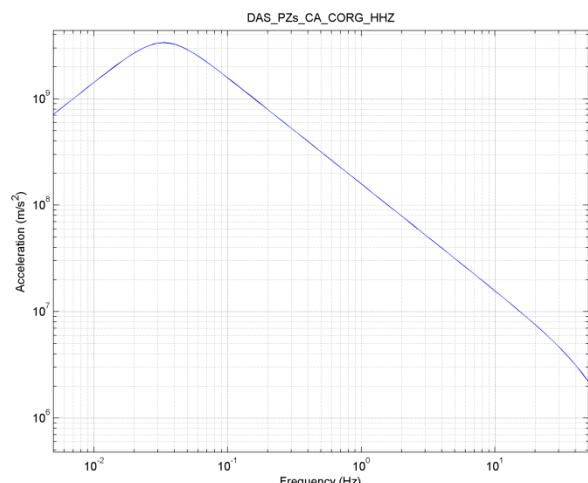
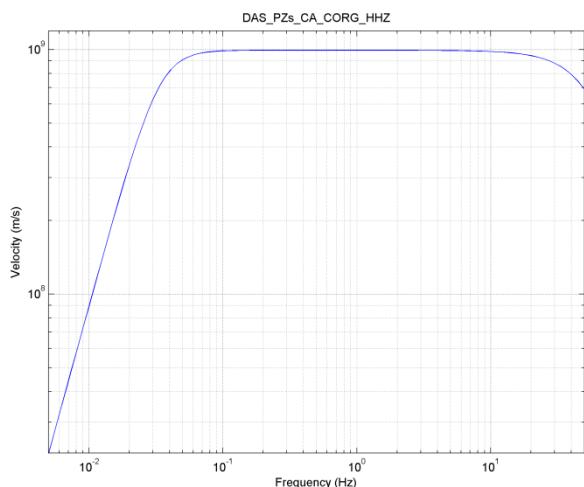
**Channel response**

Sensitivity	9.909500E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 5  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
867.0800 904.7790  
867.0800 -904.7790  
POLES 5  
-0.1480 0.1480  
-0.1480 -0.1480  
-314.1590 202.3190  
-314.1590 -202.3190  
-13338.9000 0.0000  
CONSTANT 1.179862E+03

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CORI.HHE****Coordinates (ERTS89)**

Latitude: 41.972400N

Country: Spain

Longitude: 2.048800E

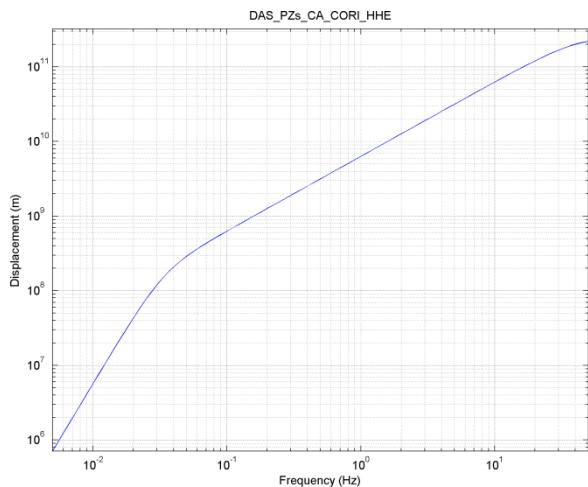
Municipality: Oristà

Elevation: 621 m

Owner: IGC

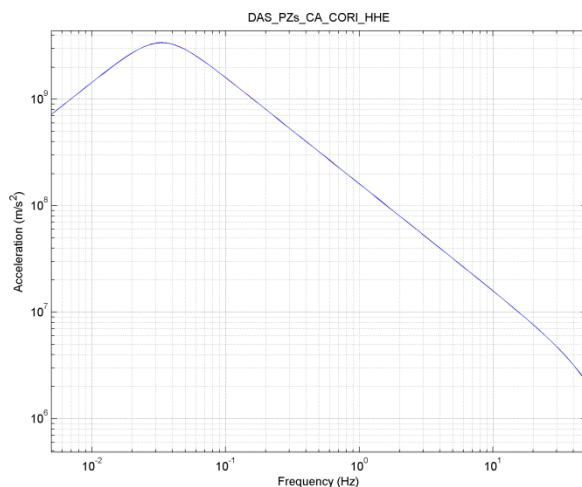
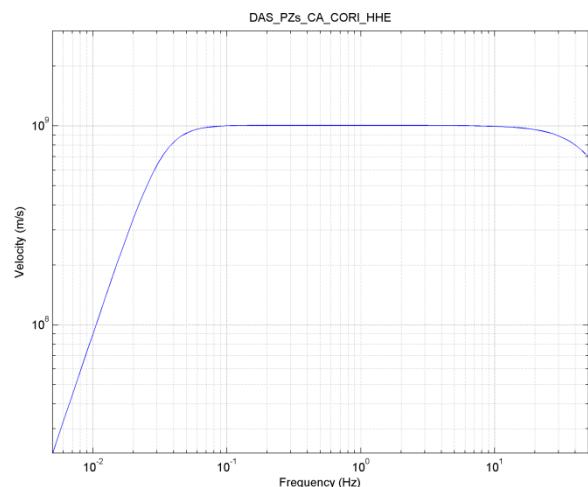
**Channel response**

Sensitivity	1.002950E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 5  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
867.0800 904.7790  
867.0800 -904.7790  
POLES 5  
-0.1480 0.1480  
-0.1480 -0.1480  
-314.1590 202.3190  
-314.1590 -202.3190  
-13338.9000 0.0000  
CONSTANT 1.194149E+03

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CORI.HHN****Coordinates (ERTS89)**

Latitude: 41.972400N

Country: Spain

Longitude: 2.048800E

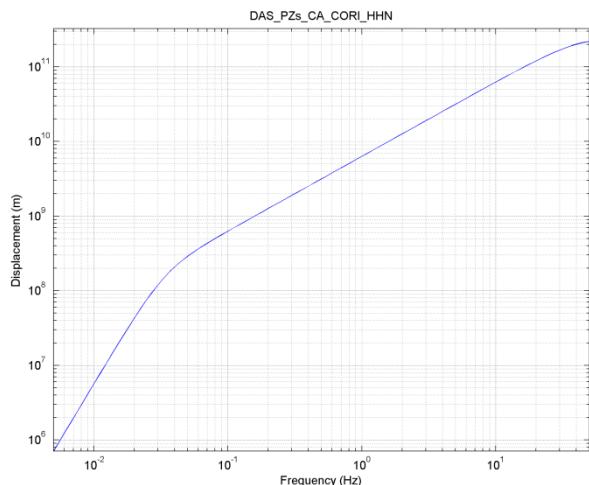
Municipality: Oristà

Elevation: 621 m

Owner: IGC

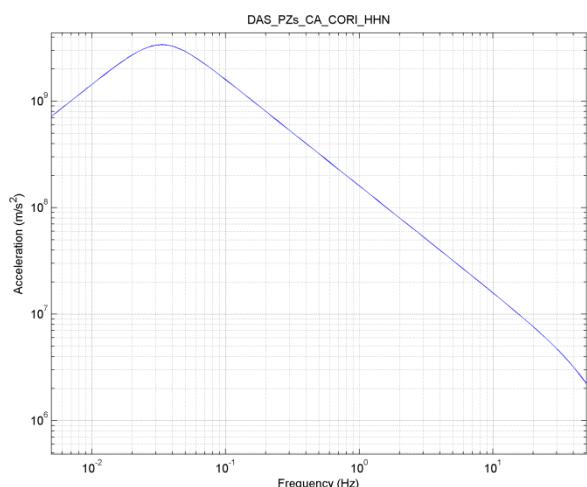
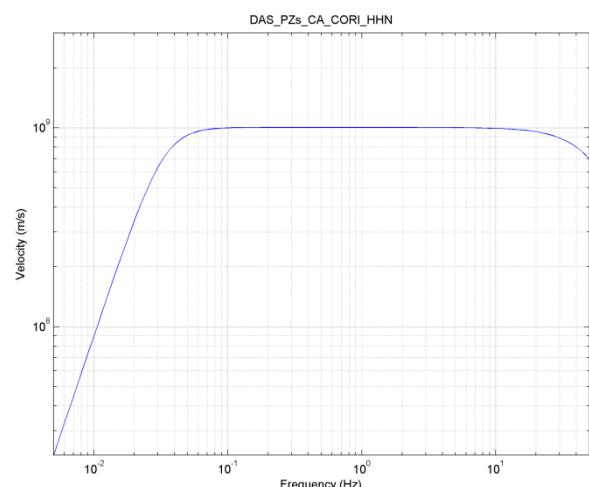
**Channel response**

Sensitivity	1.001950E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 5  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
867.0800 904.7790  
867.0800 -904.7790  
POLES 5  
-0.1480 0.1480  
-0.1480 -0.1480  
-314.1590 202.3190  
-314.1590 -202.3190  
-13338.9000 0.0000  
CONSTANT 1.192959E+03

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CORI.HHZ****Coordinates (ERTS89)**

Latitude: 41.972400N

Country: Spain

Longitude: 2.048800E

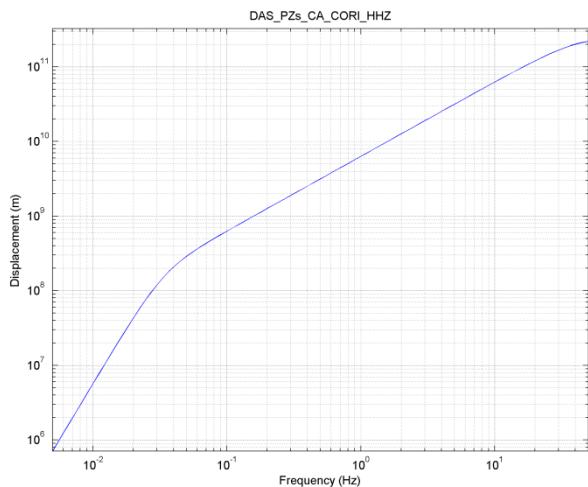
Municipality: Oristà

Elevation: 621 m

Owner: IGC

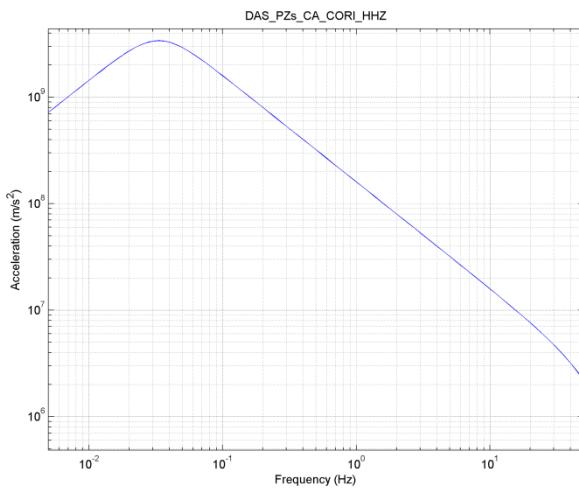
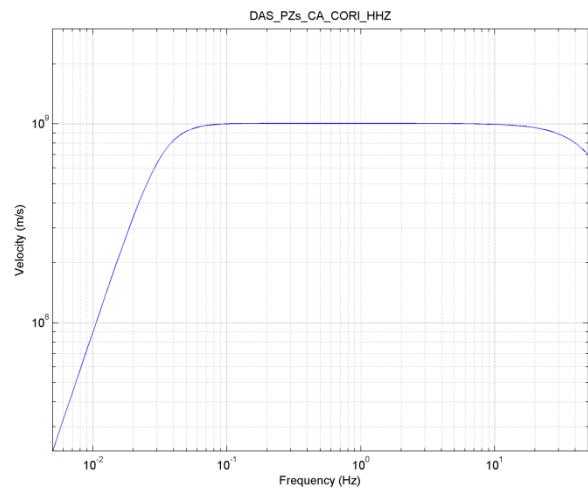
**Channel response**

Sensitivity	1.001950E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 5  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
867.0800 904.7790  
867.0800 -904.7790  
POLES 5  
-0.1480 0.1480  
-0.1480 -0.1480  
-314.1590 202.3190  
-314.1590 -202.3190  
-13338.9000 0.0000  
CONSTANT 1.192959E+03

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CPAL.HHE****Coordinates (ERTS89)**

Latitude: 42.310538N

Country: Spain

Longitude: 3.162432E

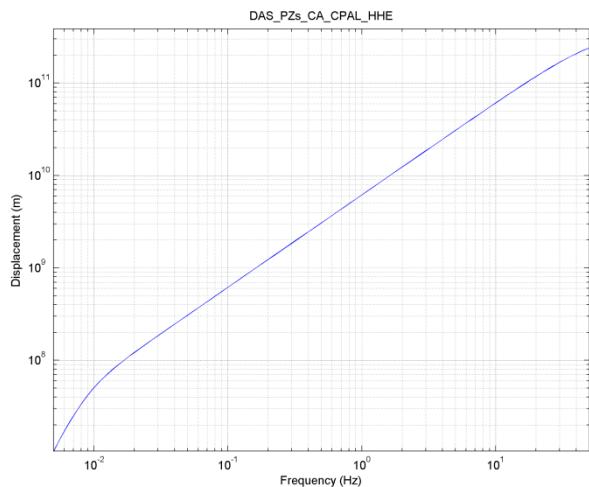
Municipality: Palau-saverdera

Elevation: 223 m

Owner: IGC

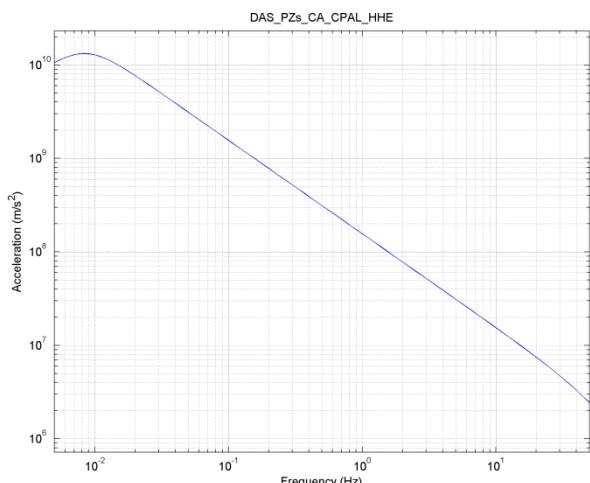
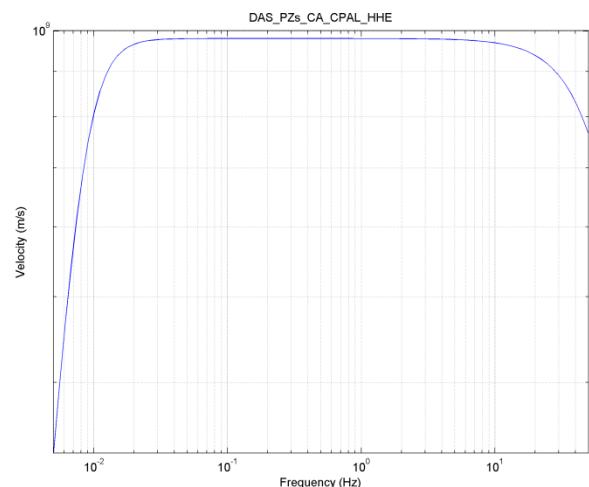
**Channel response**

Sensitivity	9.813330E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.476654E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CPAL.HHN****Coordinates (ERTS89)**

Latitude: 42.310538N

Country: Spain

Longitude: 3.162432E

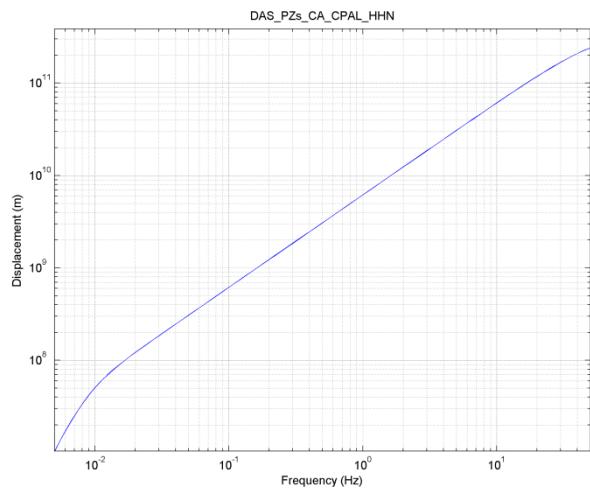
Municipality: Palau-saverdera

Elevation: 223 m

Owner: IGC

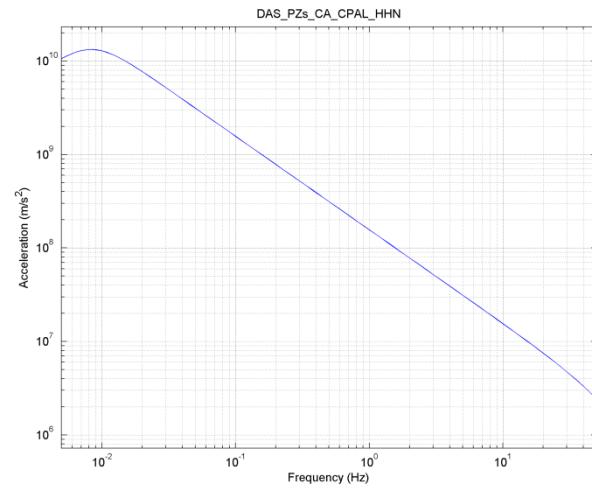
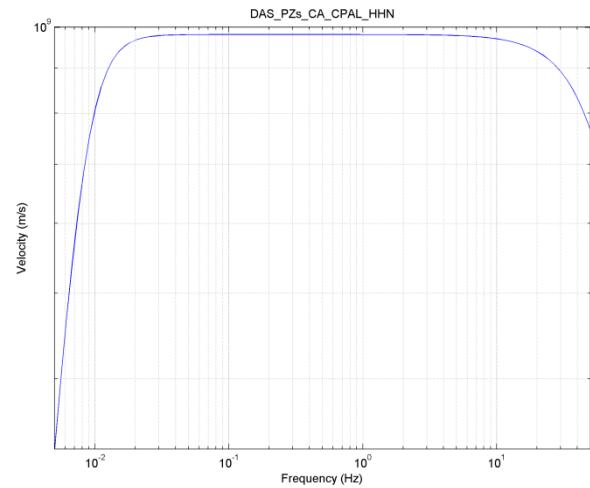
**Channel response**

Sensitivity	9.826670E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.486818E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CPAL.HHZ****Coordinates (ERTS89)**

Latitude: 42.310538N

Country: Spain

Longitude: 3.162432E

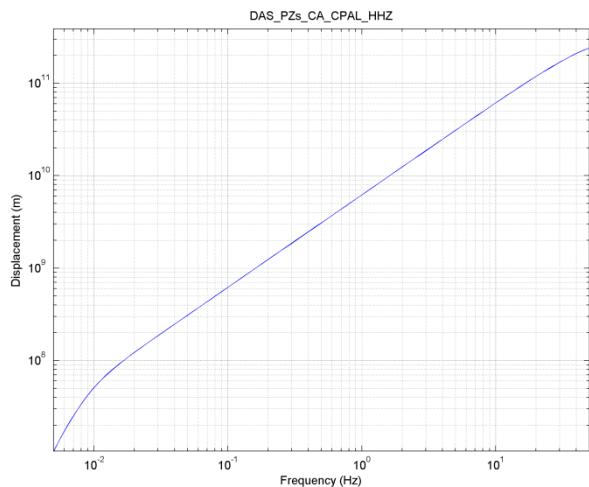
Municipality: Palau-saverdera

Elevation: 223 m

Owner: IGC

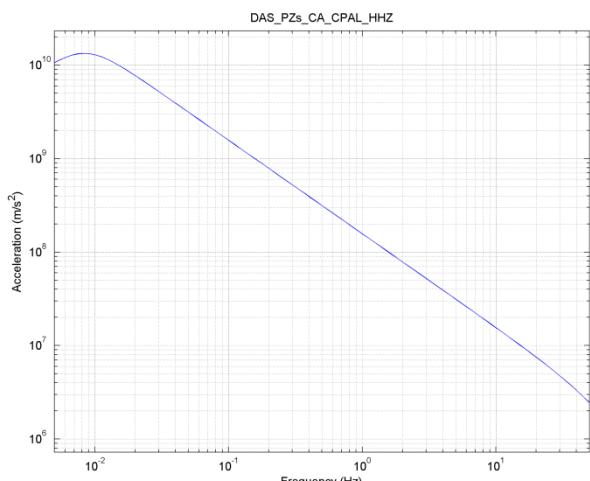
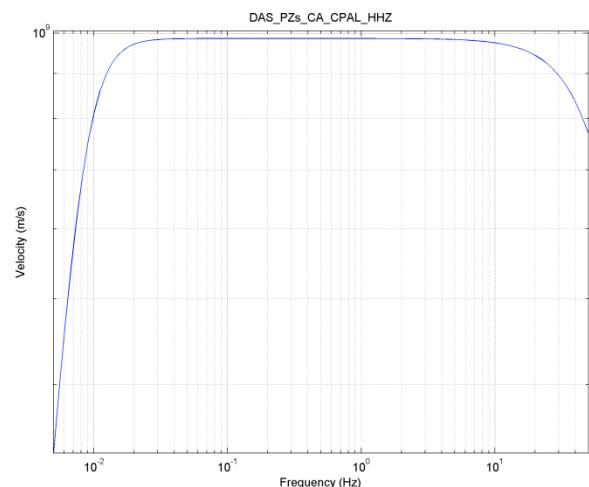
**Channel response**

Sensitivity	9.866670E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.517294E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CSOR.HHE****Coordinates (ERTS89)**

Latitude: 42.374433N

Country: Spain

Longitude: 1.132737E

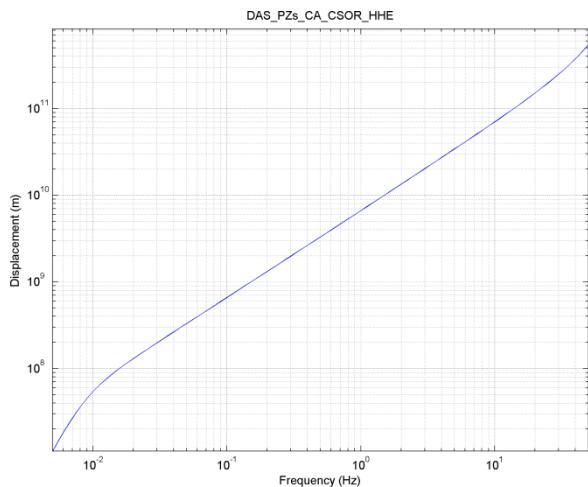
Municipality: Soriguera

Elevation: 1227 m

Owner: IGC

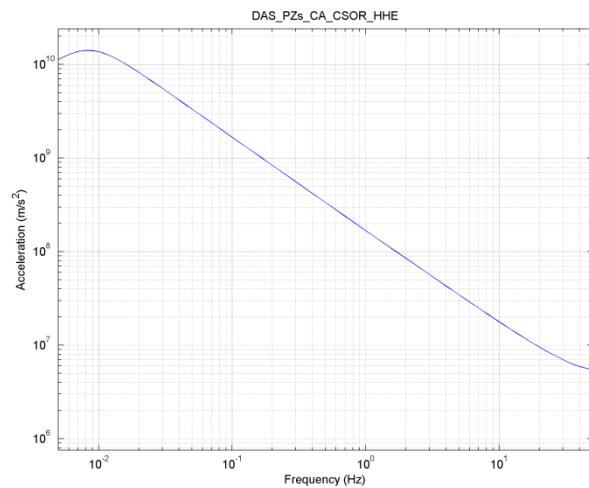
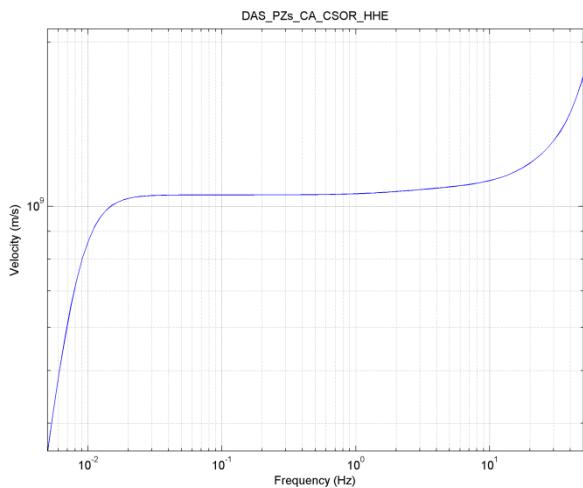
**Channel response**

Sensitivity	1.050470E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 7  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-463.1000 -430.5000  
-463.1000 430.5000  
-176.6000 0.0000  
-15.1500 0.0000  
POLES 12  
-13300.0000 0.0000  
-10530.0000 10050.0000  
-10530.0000 -10050.0000  
-520.3000 0.0000  
-374.8000 0.0000  
-97.3400 -400.7000  
-97.3400 400.7000  
-15.6400 0.0000  
-0.0370 0.0370  
-0.0370 -0.0370  
-255.0970 0.0000  
-13338.9000 0.0000  
CONSTANT 4.880082E+21

Amplitudes in nm and poles and zeros in



**NSCL code:****CA.CSOR.HHN****Coordinates (ERTS89)**

Latitude: 42.374433N

Country: Spain

Longitude: 1.132737E

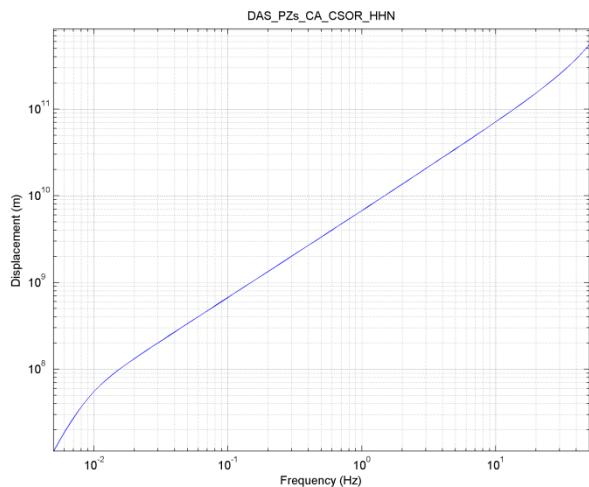
Municipality: Soriguera

Elevation: 1227 m

Owner: IGC

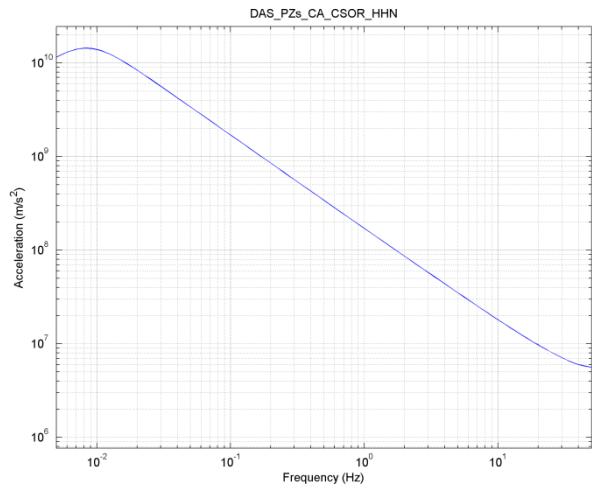
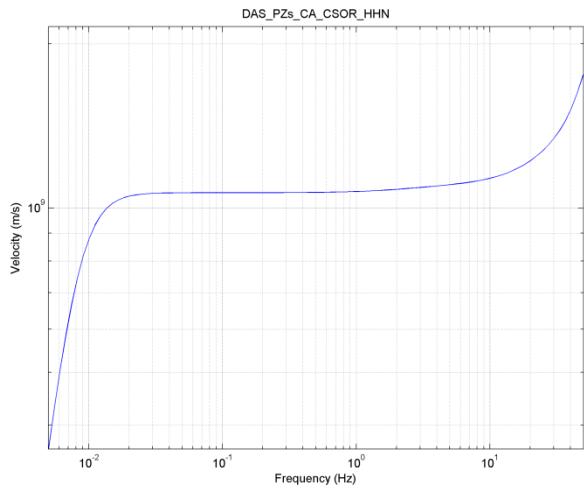
**Channel response**

Sensitivity	1.068270E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 7  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-463.1000 -430.5000  
-463.1000 430.5000  
-176.6000 0.0000  
-15.1500 0.0000  
POLES 12  
-13300.0000 0.0000  
-10530.0000 10050.0000  
-10530.0000 -10050.0000  
-520.3000 0.0000  
374.8000 0.0000  
-97.3400 -400.7000  
-97.3400 400.7000  
-15.6400 0.0000  
-0.0370 0.0370  
-0.0370 -0.0370  
-255.0970 0.0000  
-13338.9000 0.0000  
CONSTANT 4.962773E+21

Amplitudes in nm and poles and zeros in



**NSCL code:****CA.CSOR.HHZ****Coordinates (ERTS89)**

Latitude: 42.374433N

Country: Spain

Longitude: 1.132737E

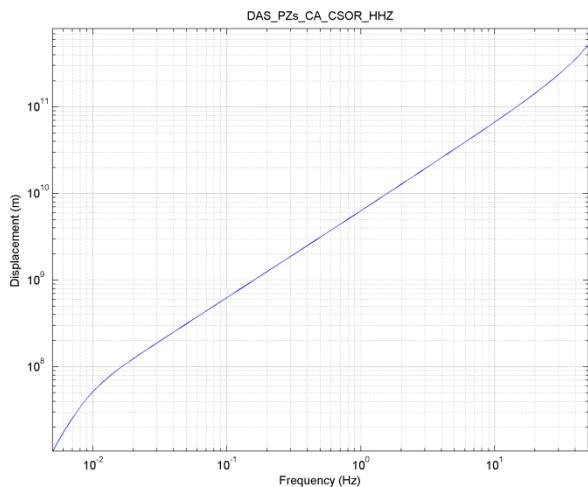
Municipality: Soriguera

Elevation: 1227 m

Owner: IGC

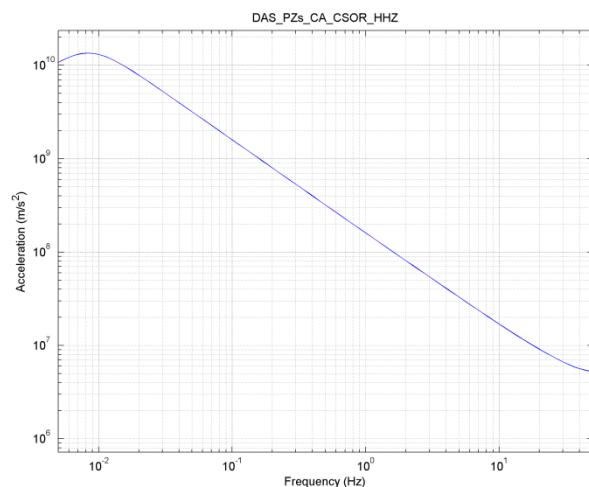
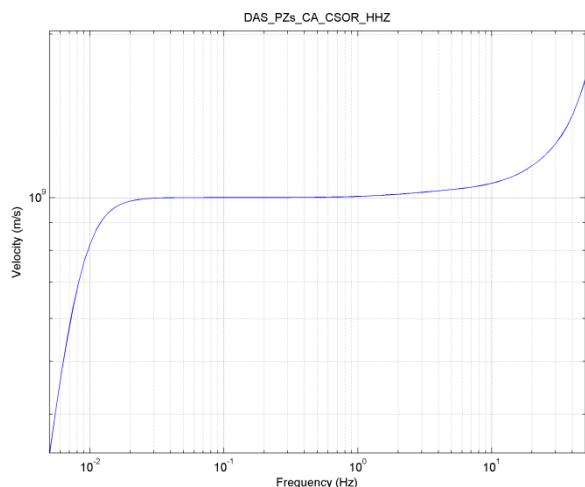
**Channel response**

Sensitivity	1.001600E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 7  
 0.0000 0.0000  
 0.0000 0.0000  
 0.0000 0.0000  
 -463.1000 -430.5000  
 -463.1000 430.5000  
 -176.6000 0.0000  
 -15.1500 0.0000  
 POLES 12  
 -13300.0000 0.0000  
 -10530.0000 10050.0000  
 -10530.0000 -10050.0000  
 -520.3000 0.0000  
 -374.8000 0.0000  
 -97.3400 -400.7000  
 -97.3400 400.7000  
 -15.6400 0.0000  
 -0.0370 0.0370  
 -0.0370 -0.0370  
 -255.0970 0.0000  
 -13338.9000 0.0000  
 CONSTANT 4.653050E+21

Amplitudes in nm and poles and zeros in



**NSCL code:****CA.CTRE.HHE****Coordinates (ERTS89)**

Latitude: 42.322278N

Country: Spain

Longitude: 0.772350E

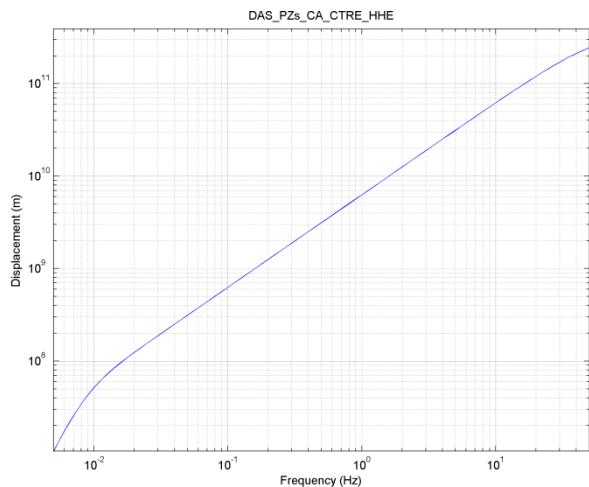
Municipality: Tremp

Elevation: 1318 m

Owner: IGC

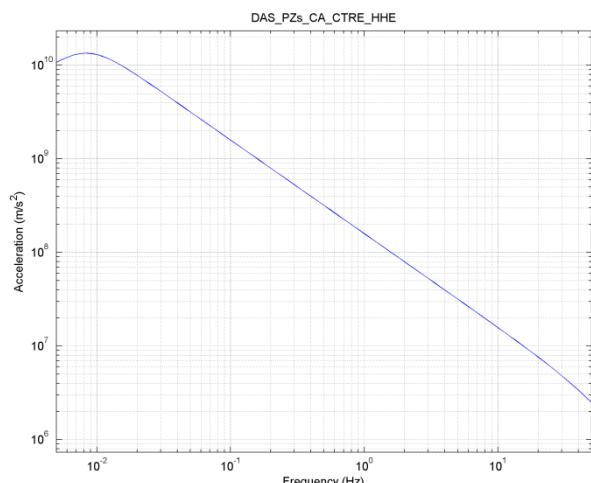
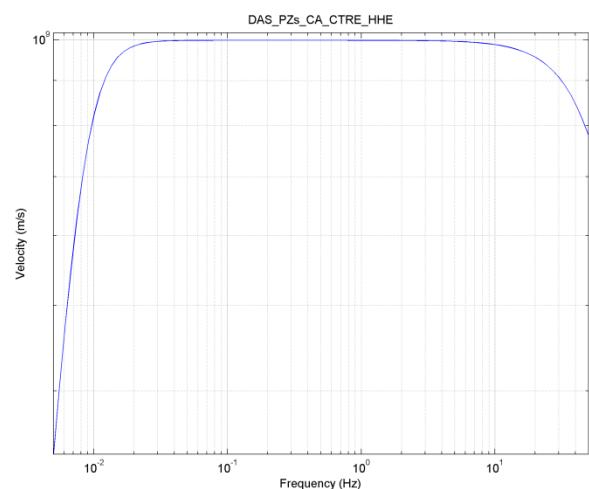
**Channel response**

Sensitivity	1.000000E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.618876e+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CTRE.HHN****Coordinates (ERTS89)**

Latitude: 42.322278N

Country: Spain

Longitude: 0.772350E

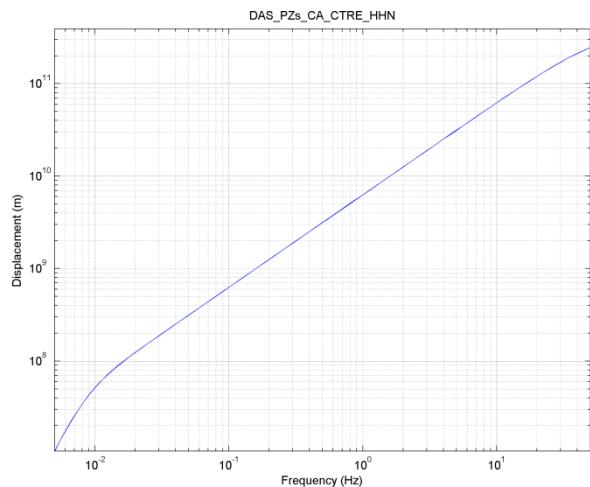
Municipality: Tremp

Elevation: 1318 m

Owner: IGC

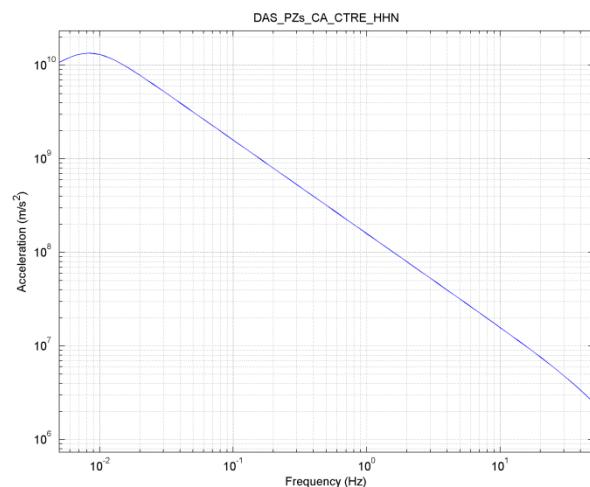
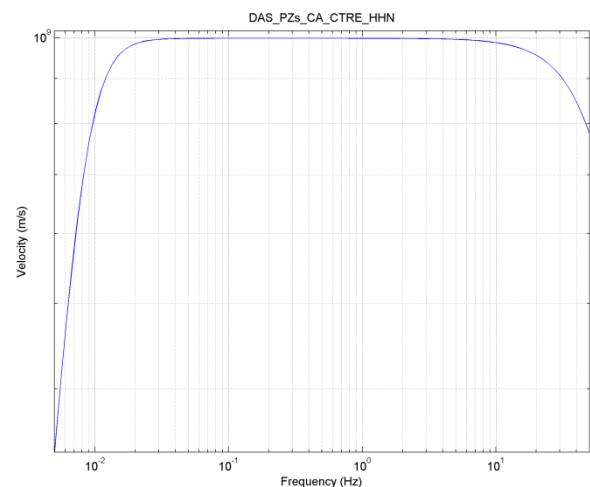
**Channel response**

Sensitivity	1.000000E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.618876e+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.CTRE.HHZ****Coordinates (ERTS89)**

Latitude: 42.322278N

Country: Spain

Longitude: 0.772350E

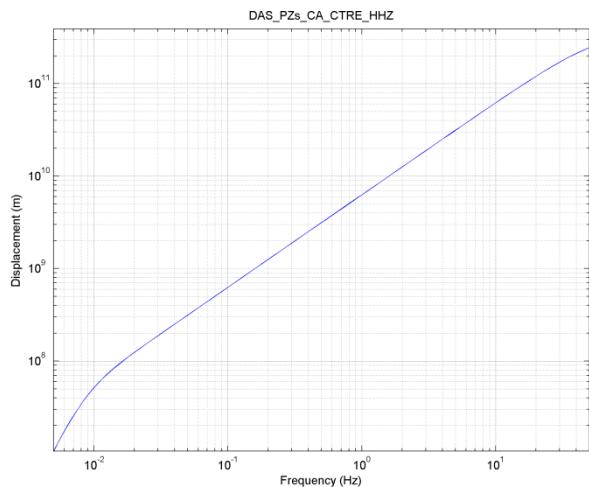
Municipality: Tremp

Elevation: 1318 m

Owner: IGC

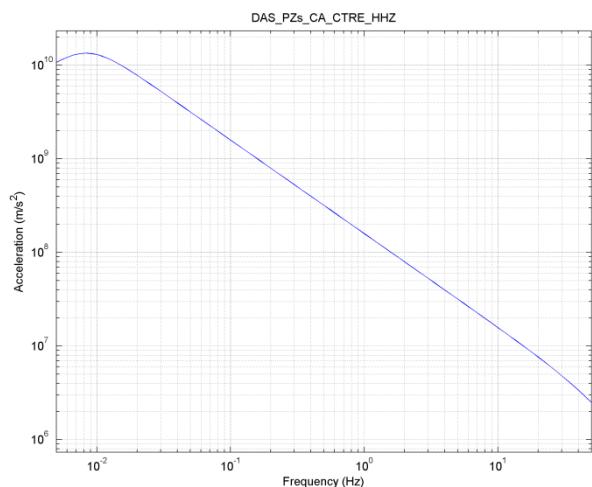
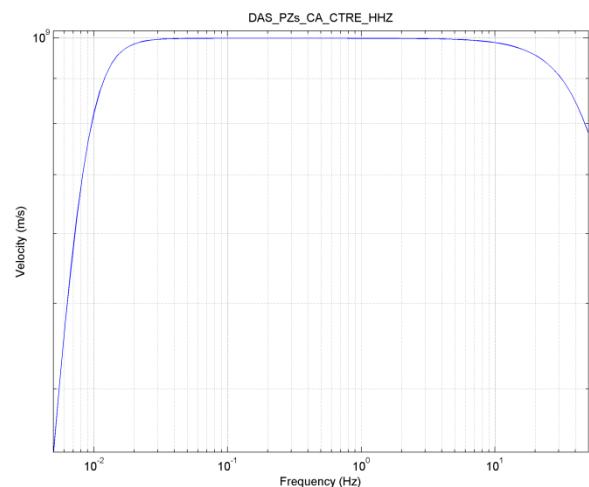
**Channel response**

Sensitivity	1.000000E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13338.9000 0.0000  
CONSTANT 7.618876e+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.EALK.HHE****Coordinates (ERTS89)**

Latitude: 42.2197N

Country: Spain

Longitude: 1.5071W

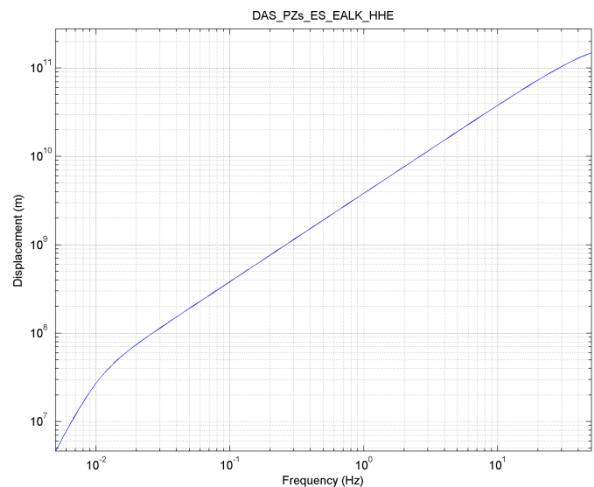
Municipality: Alkurruntz

Elevation: 965 m

Owner: IGN

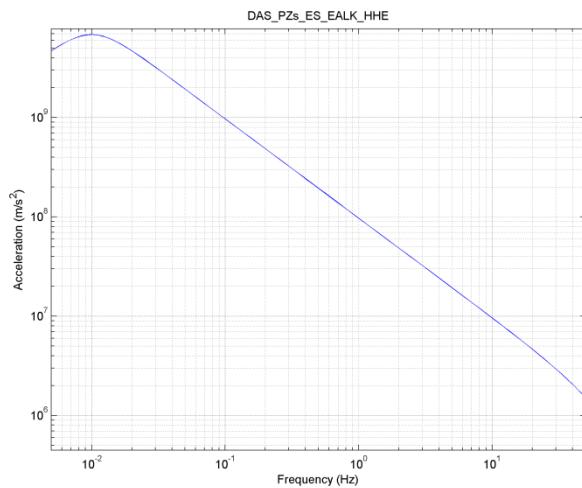
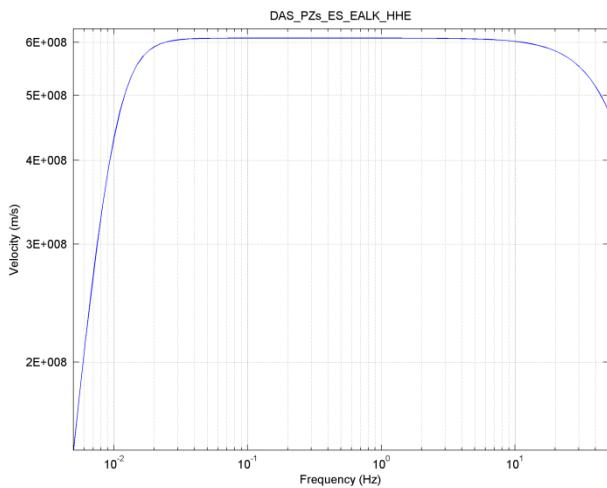
**Channel response**

Sensitivity	6.008000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0444 -0.0444  
-0.0444 0.0444  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13159.5000 0.0000  
CONSTANT 4.579196E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.EALK.HHN****Coordinates (ERTS89)**

Latitude: 42.2197N

Country: Spain

Longitude: 1.5071W

Municipality: Alkurruntz

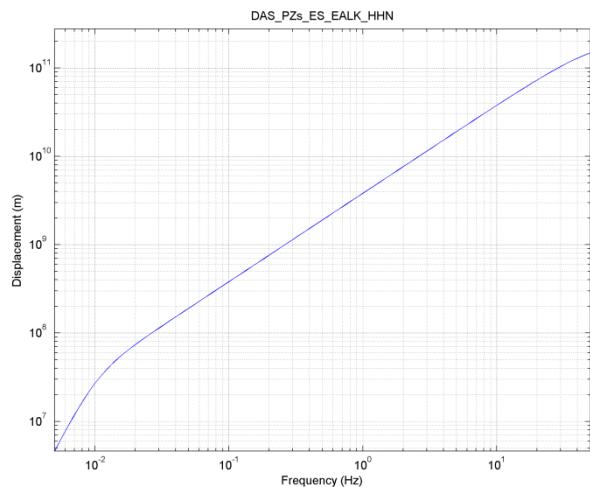
Elevation: 965 m

Owner: IGN

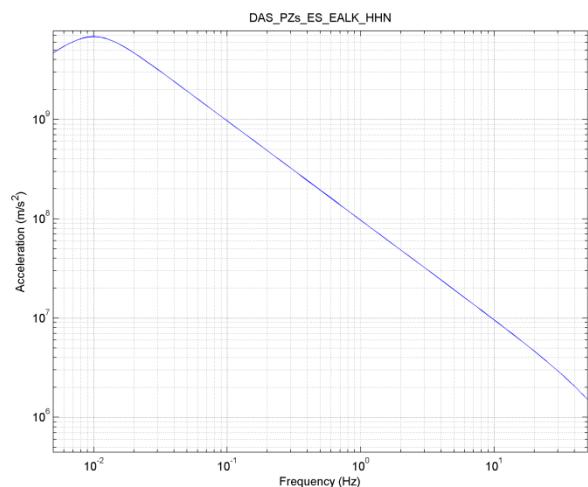
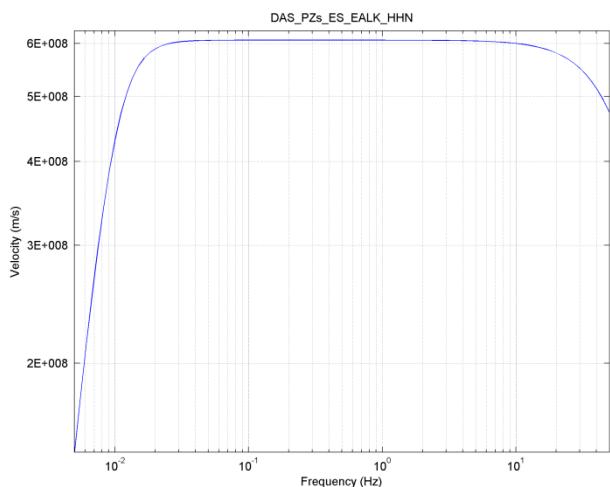
**Channel response**

Sensitivity	6.024000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100

ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0444 -0.0444  
-0.0444 0.0444  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13159.5000 0.0000  
CONSTANT 4.563550E+12



Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.EALK.HHZ****Coordinates (ERTS89)**

Latitude: 42.2197N

Country: Spain

Longitude: 1.5071W

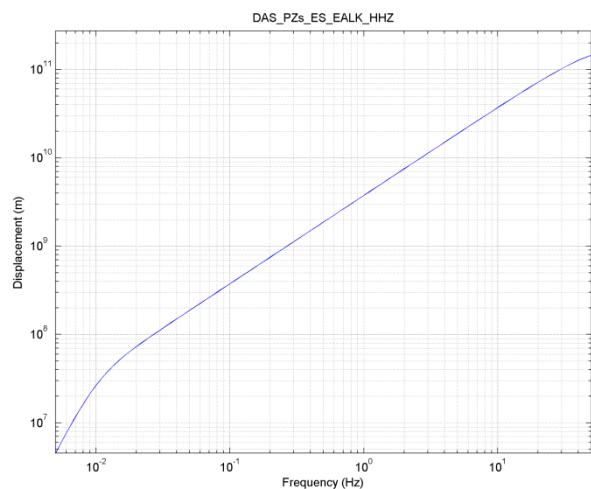
Municipality: Alkurruntz

Elevation: 965 m

Owner: IGN

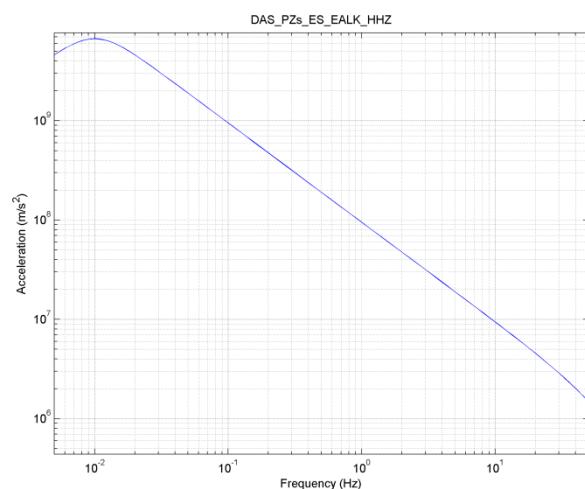
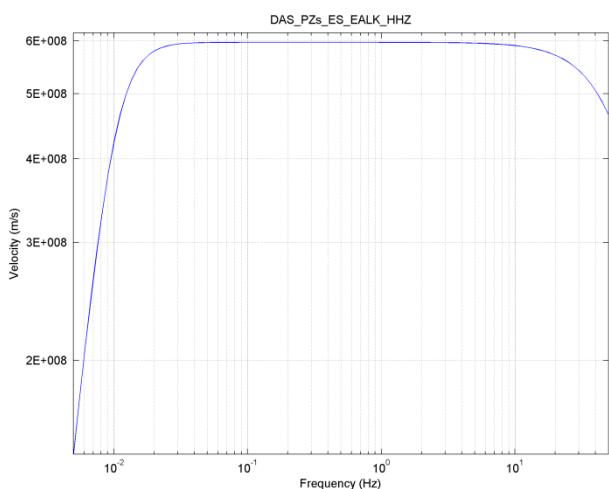
**Channel response**

Sensitivity	5.968000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0444 -0.0444  
-0.0444 0.0444  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13159.5000 0.0000  
CONSTANT 4.488935E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.EARA.HHE****Coordinates (ERTS89)**

Latitude: 42.7727N

Country: Spain

Longitude: 1.5797W

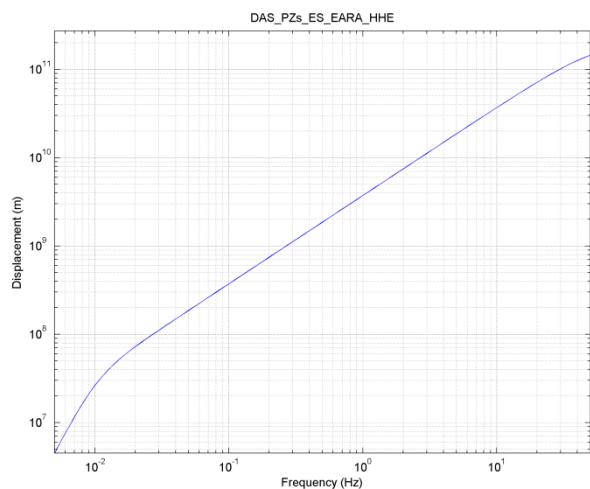
Municipality: Aranguren

Elevation: 476 m

Owner: IGN

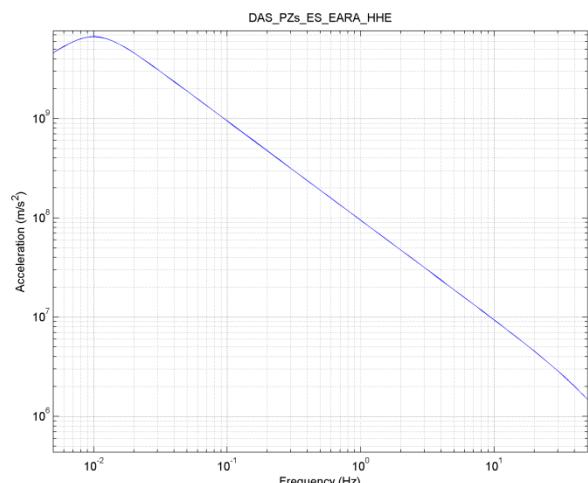
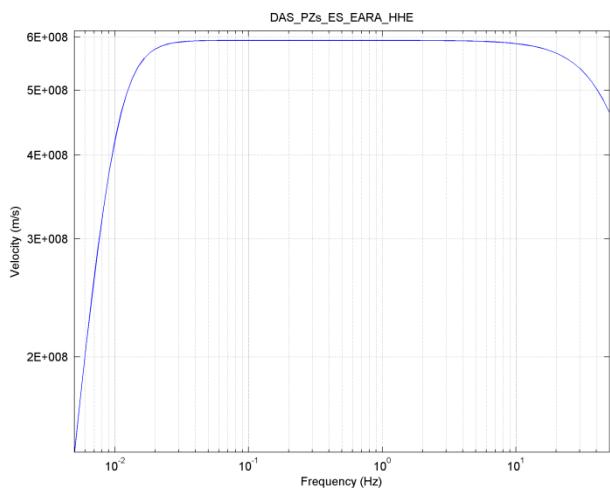
**Channel response**

Sensitivity	5.936000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



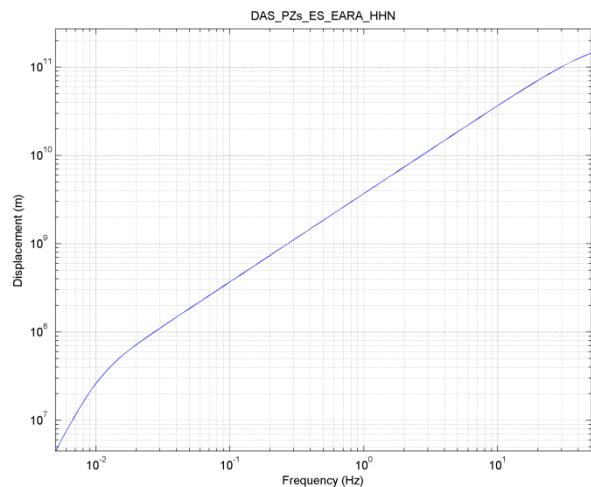
ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0444 -0.0444  
-0.0444 0.0444  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13159.5000 0.0000  
CONSTANT 4.464866E+12

Amplitudes in nm and poles and zeros in rad/s



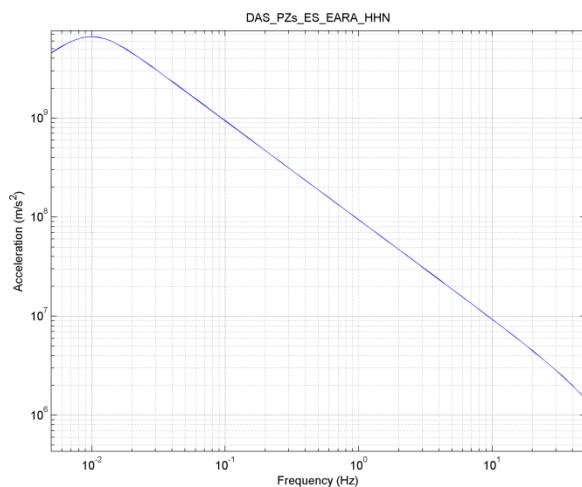
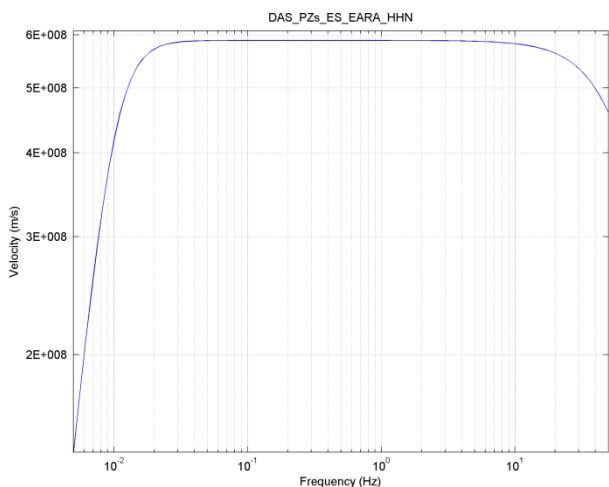
**NSCL code:****ES.EARA.HHN****Coordinates (ERTS89)**Latitude: **42.7727N**Country: **Spain**Longitude: **1.5797W**Municipality: **Aranguren**Elevation: **476 m**Owner: **IGN****Channel response**

Sensitivity	<b>5.888000E+08</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0444 -0.0444  
-0.0444 0.0444  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13159.5000 0.0000  
CONSTANT 4.428762E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.EARA.HHZ****Coordinates (ERTS89)**

Latitude: 42.7727N

Country: Spain

Longitude: 1.5797W

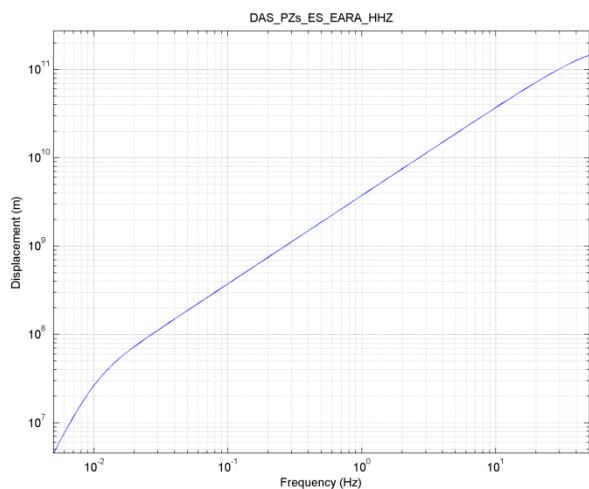
Municipality: Aranguren

Elevation: 476 m

Owner: IGN

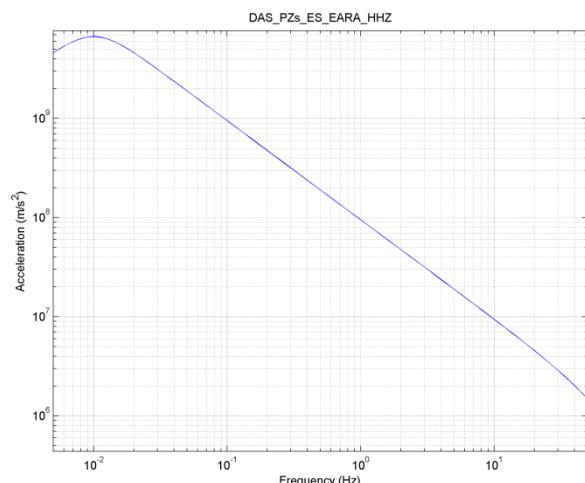
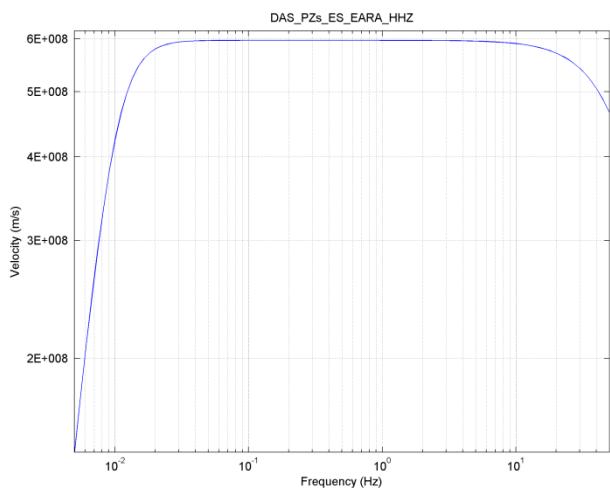
**Channel response**

Sensitivity	5.968000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



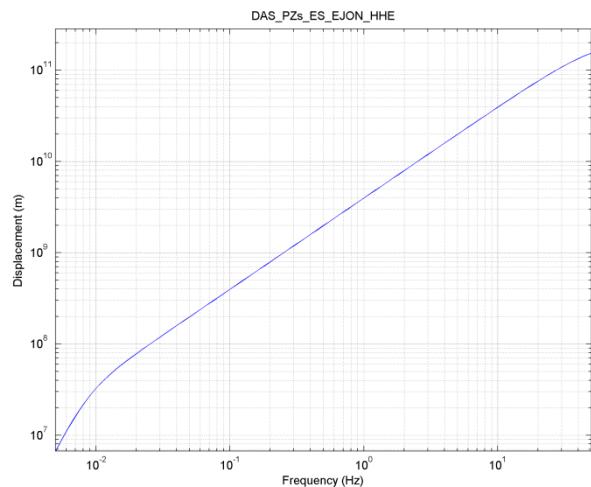
ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0444 -0.0444  
-0.0444 0.0444  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13159.5000 0.0000  
CONSTANT 4.488935E+12

Amplitudes in nm and poles and zeros in rad/s



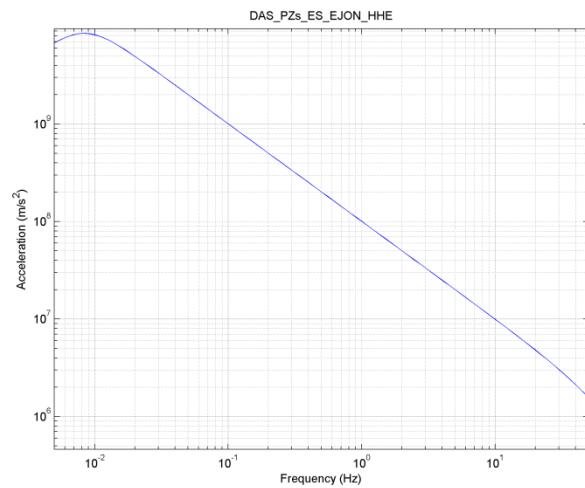
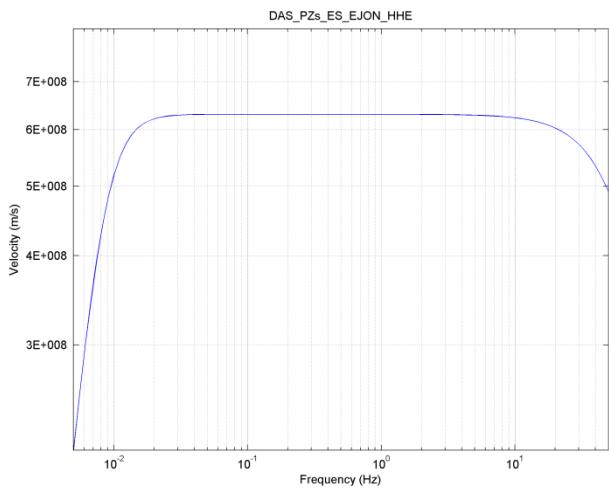
**NSCL code:****ES.EJON.HHE****Coordinates (ERTS89)**Latitude: **42.4487N**Country: **Spain**Longitude: **1.8886E**Municipality: **La Jonquera**Elevation: **570 m**Owner: **IGN****Channel response**

Sensitivity	<b>6.234720E+08</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 3  
 0.0000 0.0000  
 0.0000 0.0000  
 0.0000 0.0000  
 POLES 8  
 -0.0370 -0.0370  
 -0.0370 0.0370  
 -1130.9700 0.0000  
 -1005.3100 0.0000  
 -502.6550 0.0000  
 -9904.8000 3786.0000  
 -9904.8000 -3786.0000  
 -12507.0000 0.0000  
 CONSTANT 5.067499e+20

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.EJON.HHN****Coordinates (ERTS89)**

Latitude: 42.4487N

Country: Spain

Longitude: 1.8886E

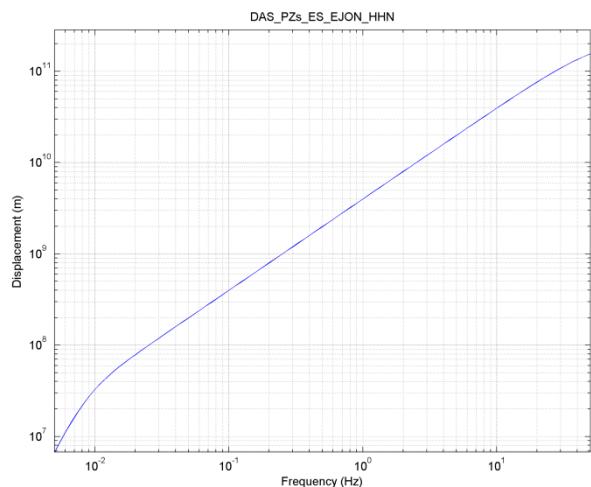
Municipality: La Jonquera

Elevation: 570 m

Owner: IGN

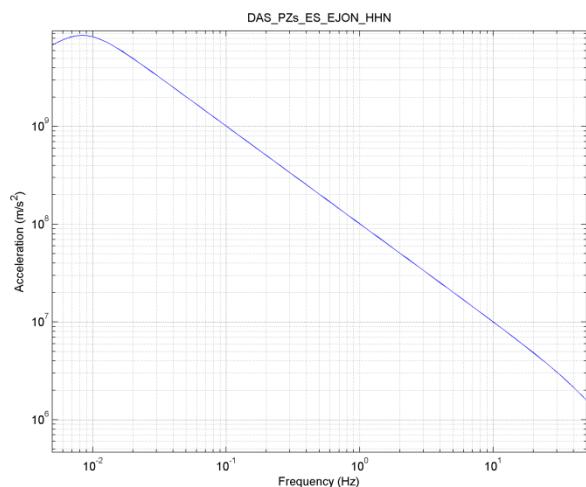
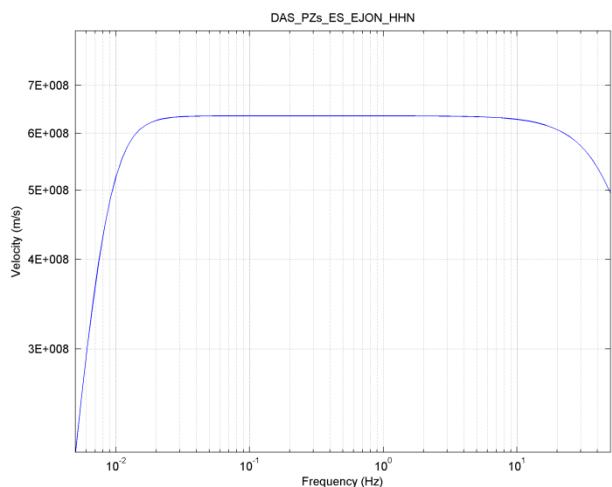
**Channel response**

Sensitivity	6.276620E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



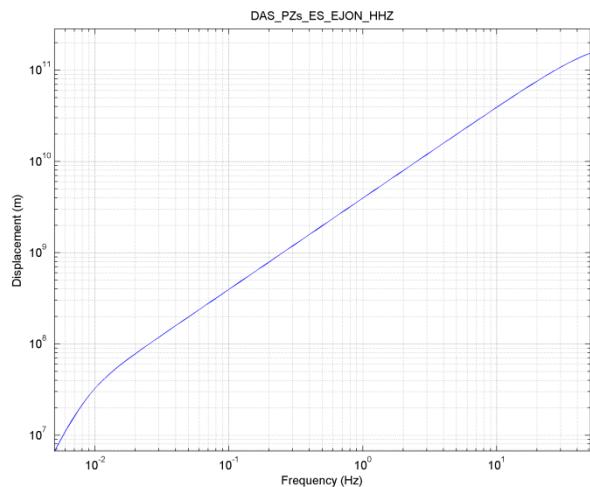
ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 8  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-9904.8000 3786.0000  
-9904.8000 -3786.0000  
-12507.0000 0.0000  
CONSTANT 5.101556e+20

Amplitudes in nm and poles and zeros in rad/s



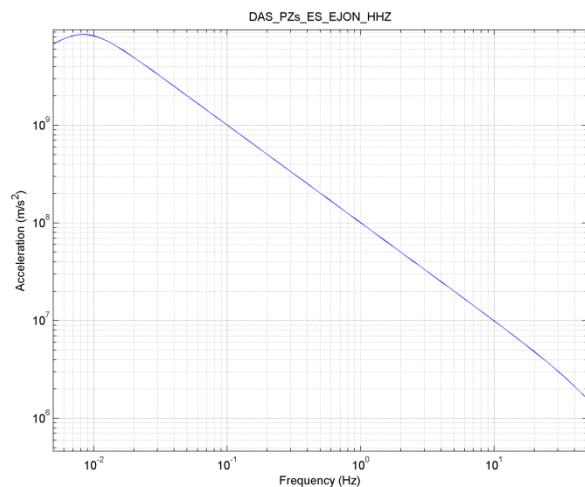
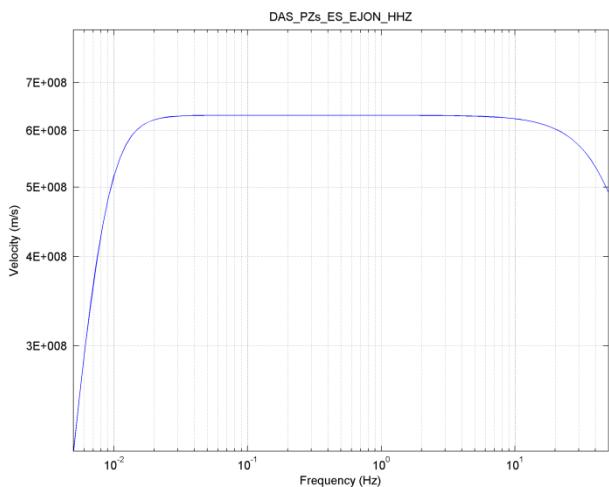
**NSCL code:****ES.EJON.HHZ****Coordinates (ERTS89)**Latitude: **42.4487N**Country: **Spain**Longitude: **1.8886E**Municipality: **La Jonquera**Elevation: **570 m**Owner: **IGN****Channel response**

Sensitivity	<b>6.234720E+08</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 8  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-9904.8000 3786.0000  
-9904.8000 -3786.0000  
-12507.0000 0.0000  
CONSTANT 5.067499e+20

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.EORO.HHE****Coordinates (ERTS89)**

Latitude: 42.8926N

Country: Spain

Longitude: 1.3095W

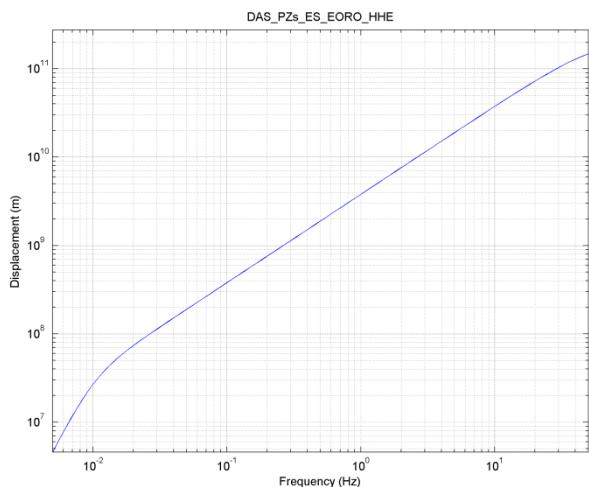
Municipality: Oroz Betelu

Elevation: 880 m

Owner: IGN

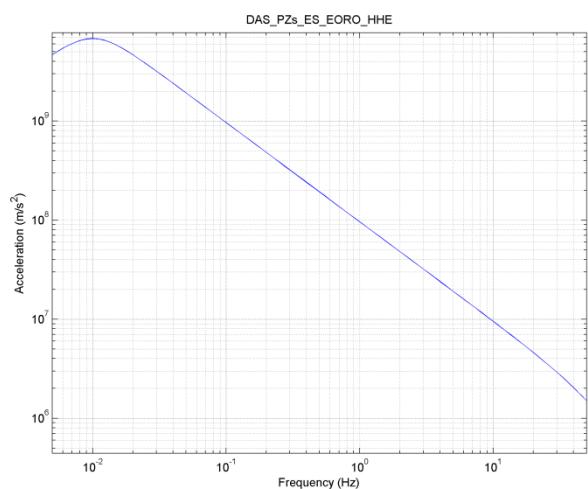
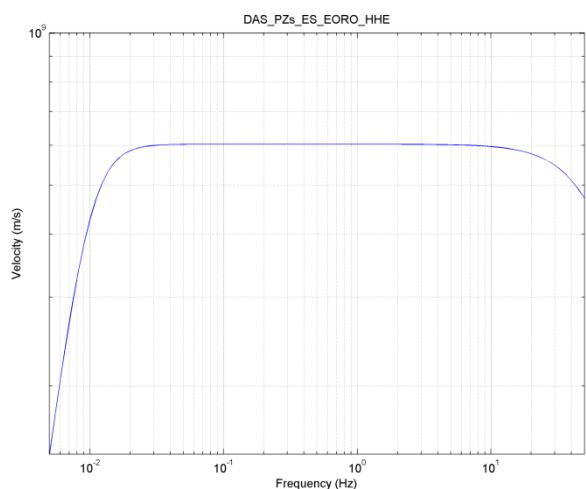
**Channel response**

Sensitivity	6.032000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0444 -0.0444  
-0.0444 0.0444  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13159.5000 0.0000  
CONSTANT 4.537074E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.EORO.HHN****Coordinates (ERTS89)**

Latitude: 42.8926N

Country: Spain

Longitude: 1.3095W

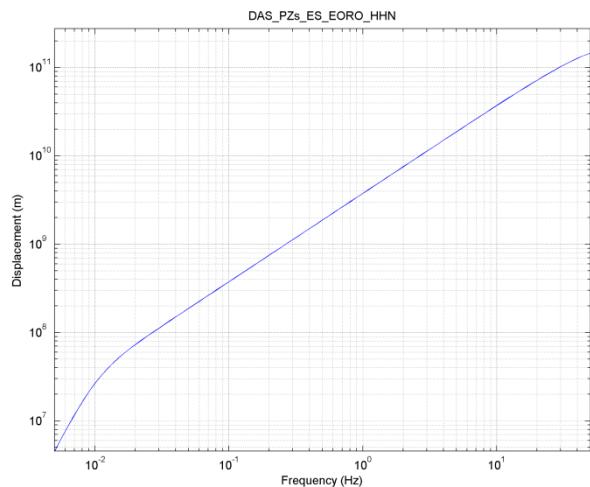
Municipality: Oroz Betelu

Elevation: 880 m

Owner: IGN

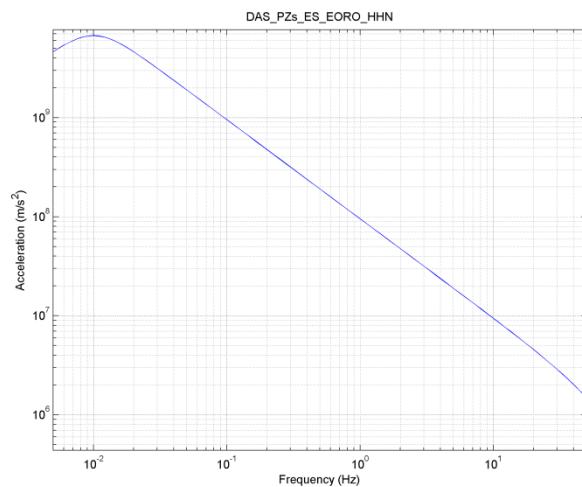
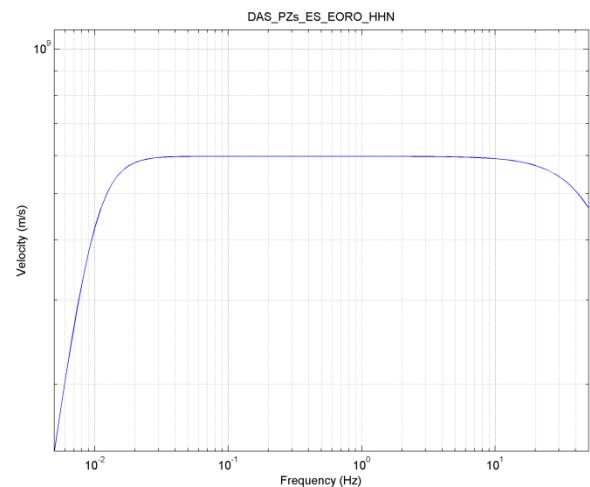
**Channel response**

Sensitivity	6.008000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0444 -0.0444  
-0.0444 0.0444  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13159.5000 0.0000  
CONSTANT 4.494953E+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.EORO.HHZ****Coordinates (ERTS89)**

Latitude: 42.8926N

Country: Spain

Longitude: 1.3095W

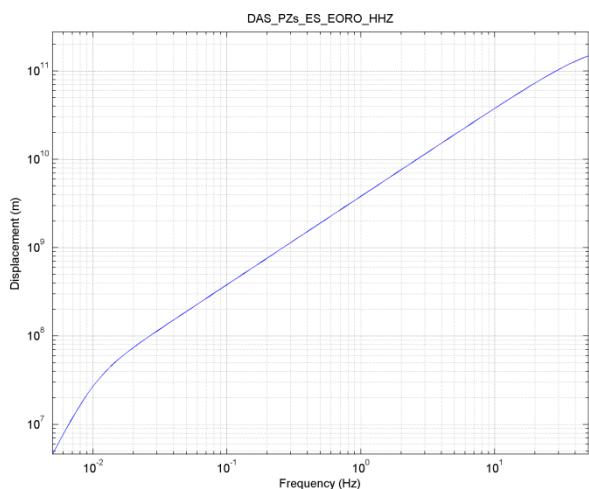
Municipality: Oroz Betelu

Elevation: 880 m

Owner: IGN

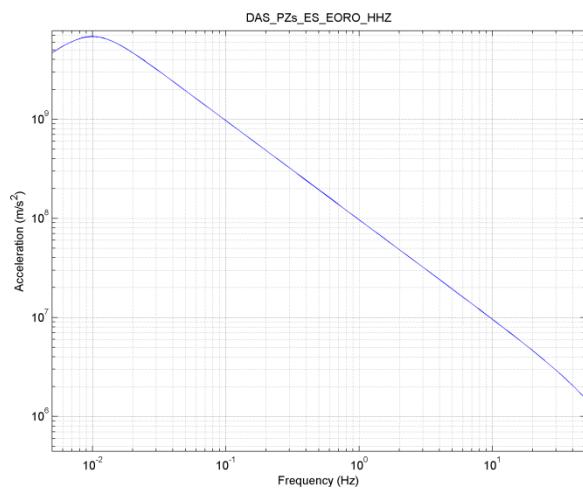
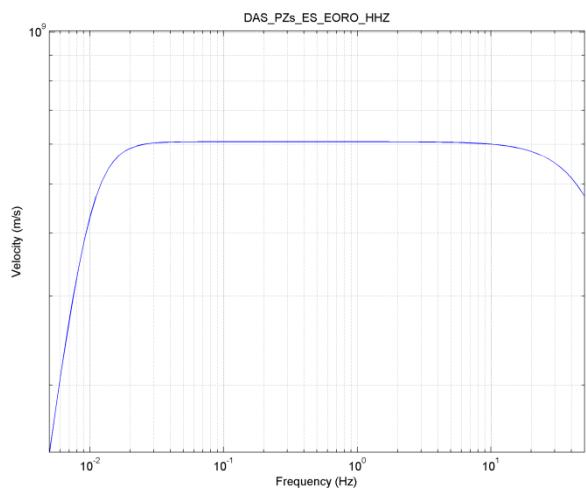
**Channel response**

Sensitivity	6.068000E+08
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



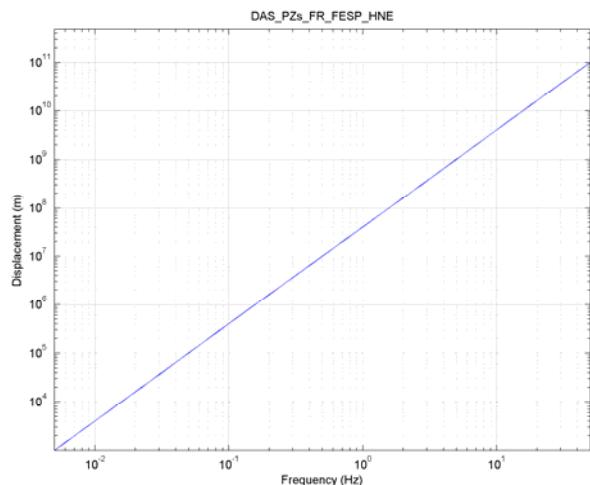
ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 6  
-0.0444 -0.0444  
-0.0444 0.0444  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
-13159.5000 0.0000  
CONSTANT 4.564152E+12

Amplitudes in nm and poles and zeros in rad/s



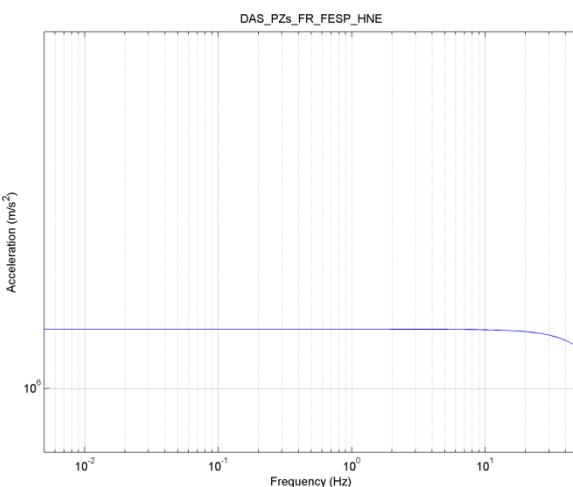
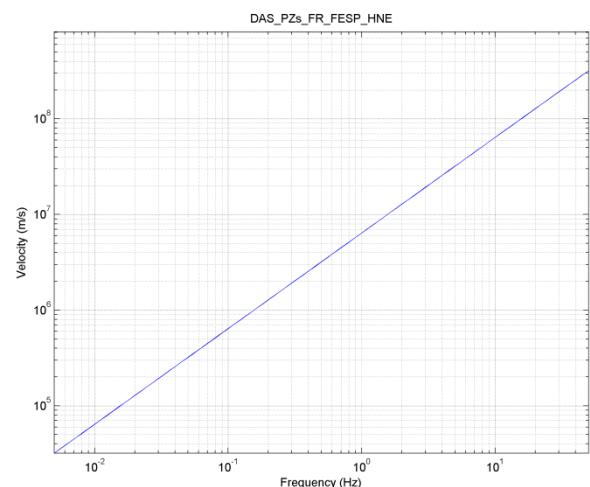
**NSCL code:****FR.FESP.HNE****Coordinates (ERTS89)**Latitude: **42.8187N**Country: **France**Longitude: **2.8207E**Municipality: **Espira de l'Agly**Elevation: **164 m**Owner: **BRGM****Channel response**

Sensitivity	<b>1.020360E+06</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>100</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-981.0000 1009.0000  
-981.0000 -1009.0000  
-3290.0000 1263.0000  
-3290.0000 -1263.0000  
-13338.9000 0.0000  
CONSTANT 3.342691E+14

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.FESP.HNN****Coordinates (ERTS89)**

Latitude: 42.8187N

Country: France

Longitude: 2.8207E

Municipality: Espira de l'Agly

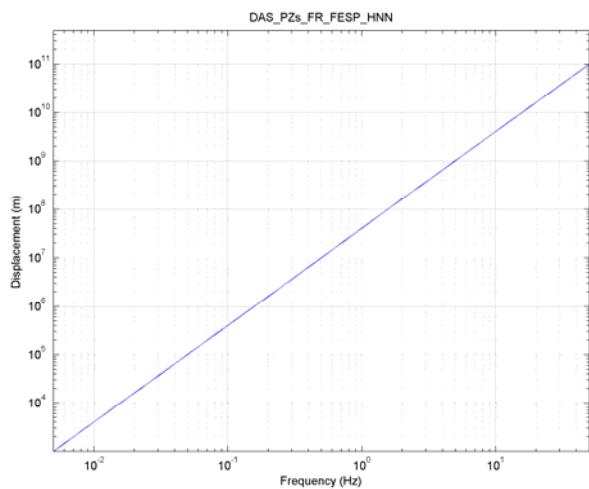
Elevation: 164 m

Owner: BRGM

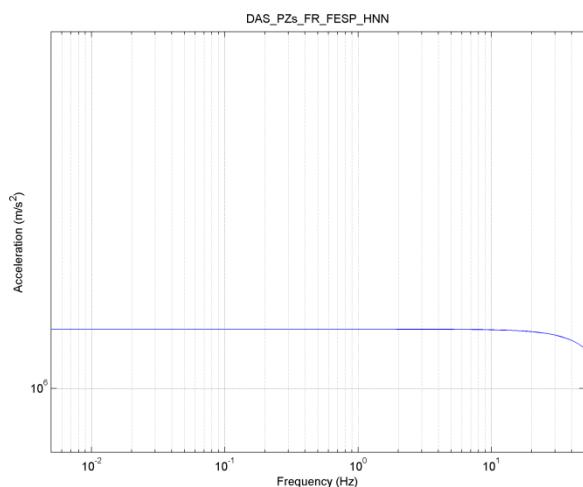
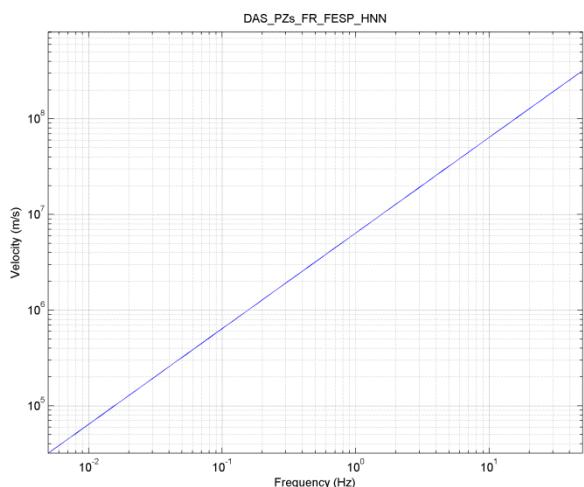
**Channel response**

Sensitivity	1.020360E+06
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	100

ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-981.0000 1009.0000  
-981.0000 -1009.0000  
-3290.0000 1263.0000  
-3290.0000 -1263.0000  
-13338.9000 0.0000  
CONSTANT 3.342691E+14

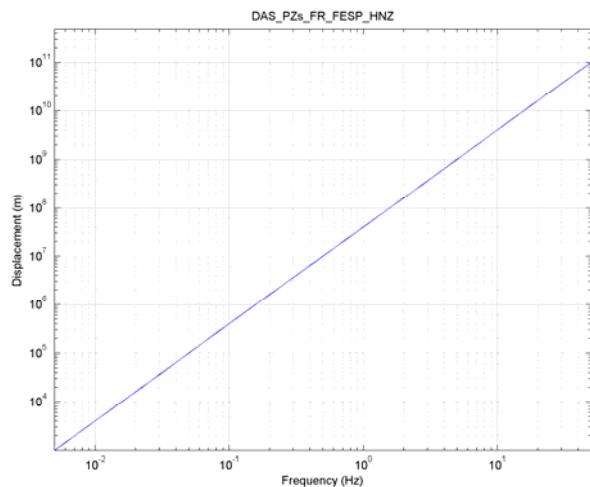


Amplitudes in nm and poles and zeros in rad/s



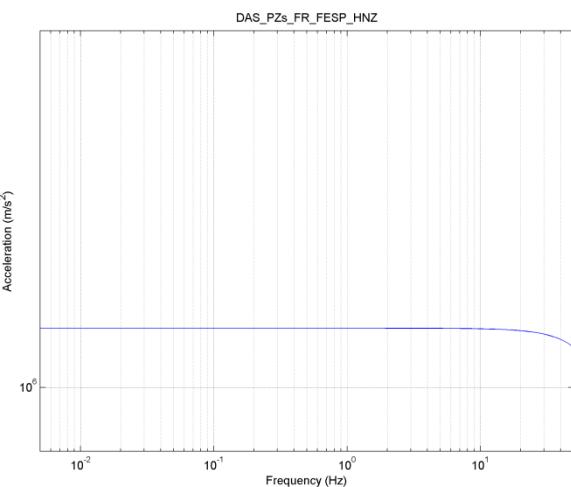
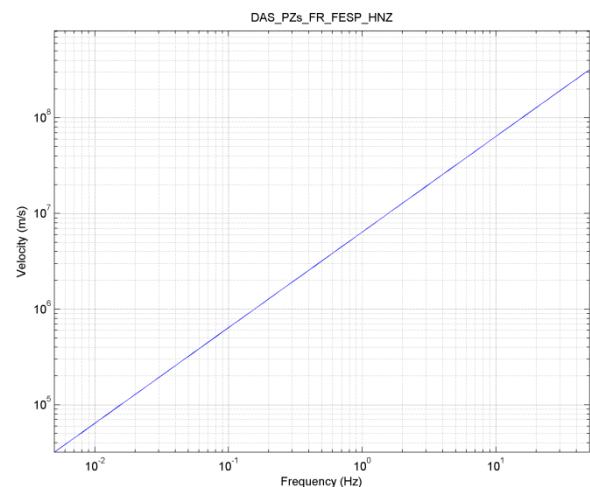
**NSCL code:****FR.FESP.HNZ****Coordinates (ERTS89)**Latitude: **42.8187N**Country: **France**Longitude: **2.8207E**Municipality: **Espira de l'Agly**Elevation: **164 m**Owner: **BRGM****Channel response**

Sensitivity	<b>1.020360E+06</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>100</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-981.0000 1009.0000  
-981.0000 -1009.0000  
-3290.0000 1263.0000  
-3290.0000 -1263.0000  
-13338.9000 0.0000  
CONSTANT 3.342691E+14

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.FMON.HNE****Coordinates (ERTS89)**

Latitude: 43.062370N

Country: France

Longitude: 0.415176E

Municipality: Montoussé

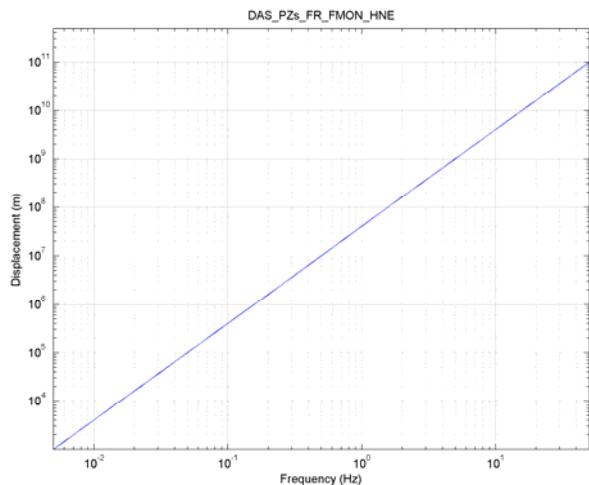
Elevation: 647 m

Owner: BRGM

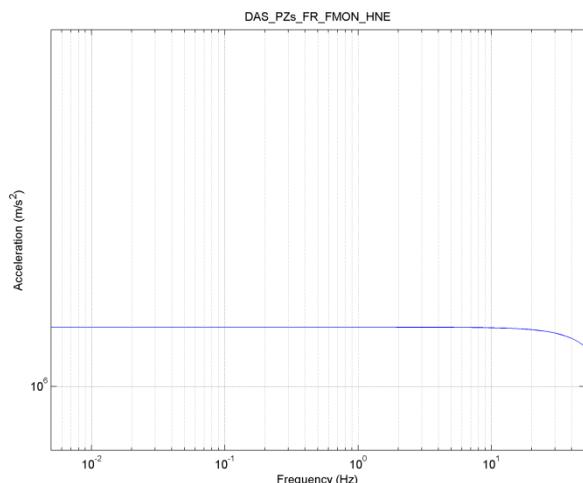
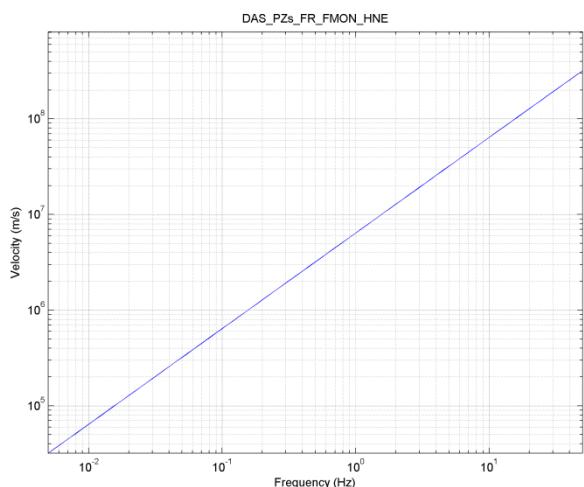
**Channel response**

Sensitivity	1.020360E+06
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	100

ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-981.0000 1009.0000  
-981.0000 -1009.0000  
-3290.0000 1263.0000  
-3290.0000 -1263.0000  
-13338.9000 0.0000  
CONSTANT 3.342691E+14



Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.FMON.HNN****Coordinates (ERTS89)**

Latitude: 43.062370N

Country: France

Longitude: 0.415176E

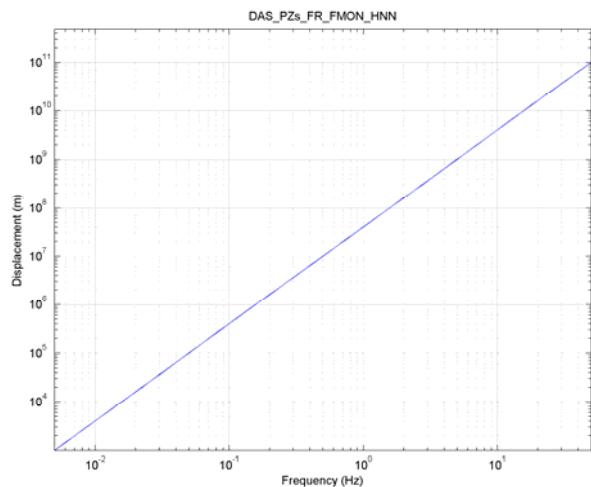
Municipality: Montoussé

Elevation: 647 m

Owner: BRGM

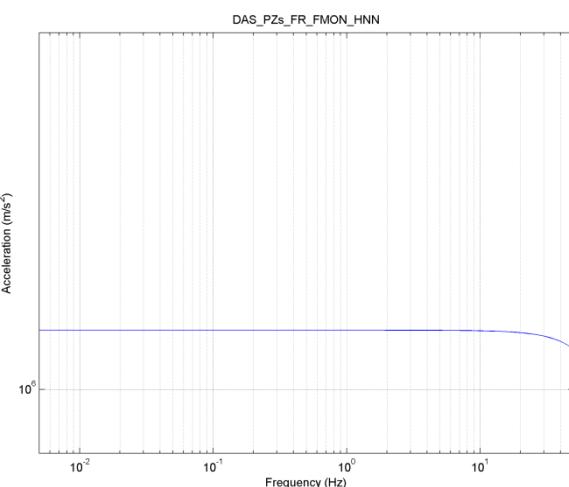
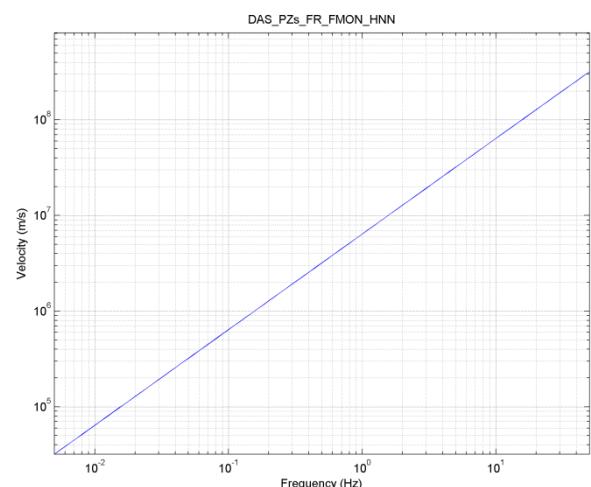
**Channel response**

Sensitivity	1.020360E+06
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	100



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-981.0000 1009.0000  
-981.0000 -1009.0000  
-3290.0000 1263.0000  
-3290.0000 -1263.0000  
-13338.9000 0.0000  
CONSTANT 3.342691E+14

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.FMON.HNZ****Coordinates (ERTS89)**

Latitude: 43.062370N

Country: France

Longitude: 0.415176E

Municipality: Montoussé

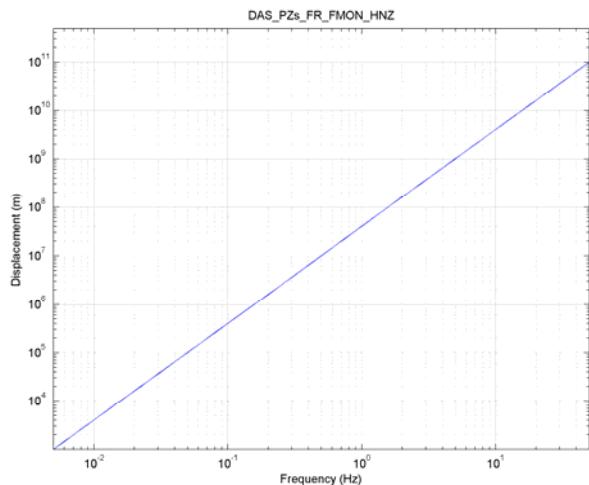
Elevation: 647 m

Owner: BRGM

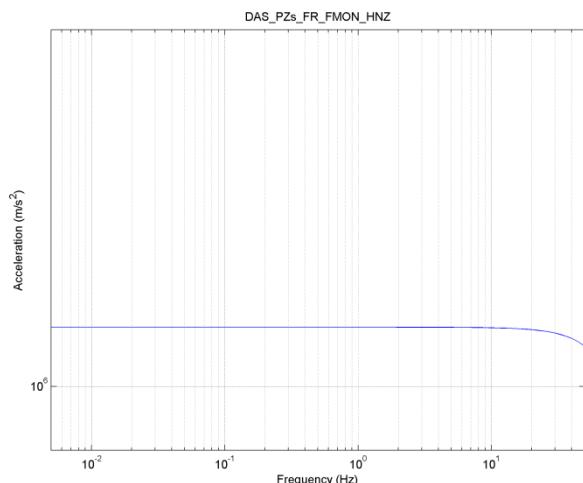
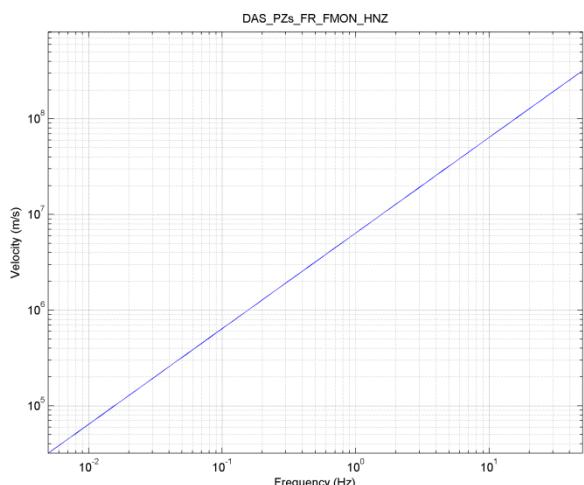
**Channel response**

Sensitivity	1.020360E+06
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	100

ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-981.0000 1009.0000  
-981.0000 -1009.0000  
-3290.0000 1263.0000  
-3290.0000 -1263.0000  
-13338.9000 0.0000  
CONSTANT 3.342691E+14



Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.FNEB.HNE****Coordinates (ERTS89)**

Latitude: 42.903080N

Country: France

Longitude: 2.106403E

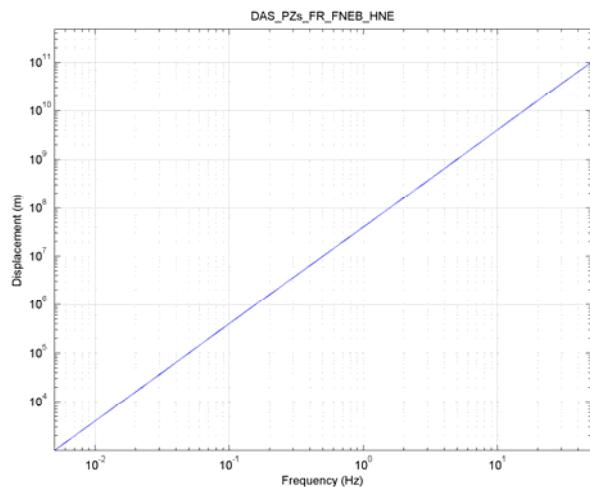
Municipality: Nébias

Elevation: 578 m

Owner: BRGM

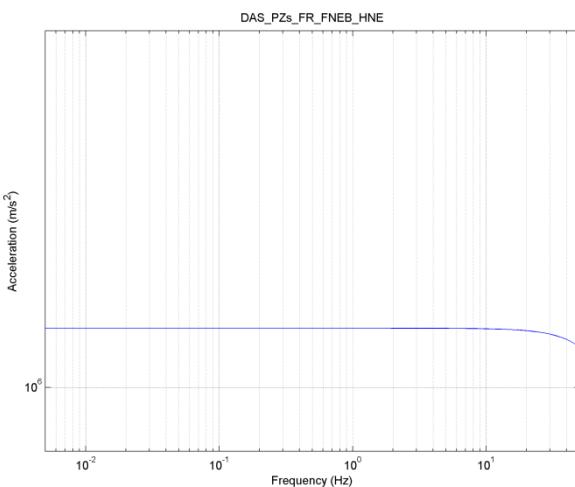
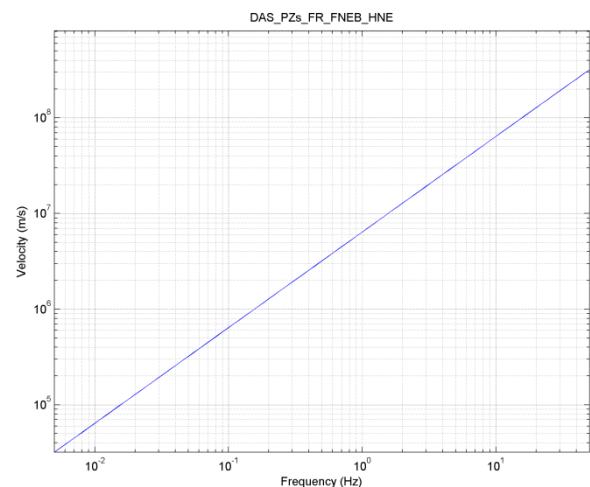
**Channel response**

Sensitivity	1.020360E+06
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	100



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-981.0000 1009.0000  
-981.0000 -1009.0000  
-3290.0000 1263.0000  
-3290.0000 -1263.0000  
-13338.9000 0.0000  
CONSTANT 3.342691E+14

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.FNEB.HNN****Coordinates (ERTS89)**

Latitude: 42.903080N

Country: France

Longitude: 2.106403E

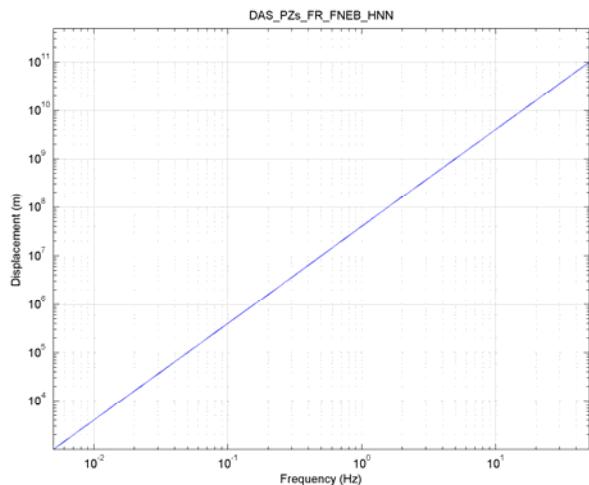
Municipality: Nébias

Elevation: 578 m

Owner: BRGM

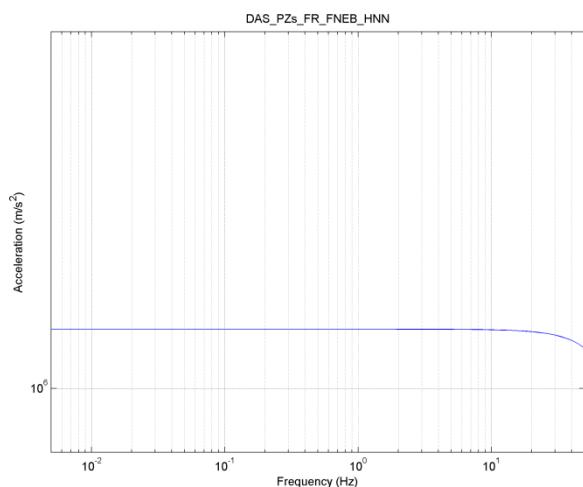
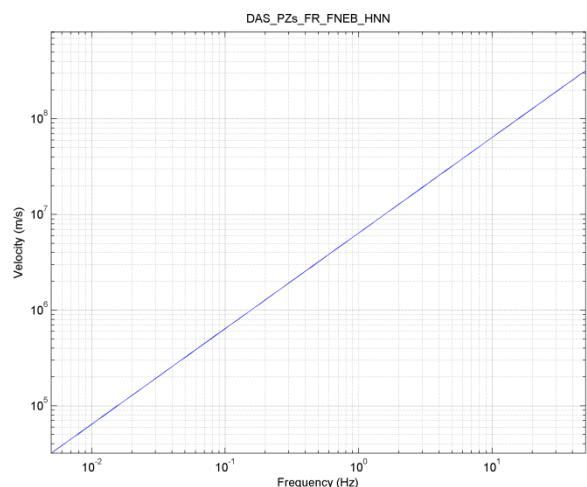
**Channel response**

Sensitivity	1.020360E+06
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	100



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-981.0000 1009.0000  
-981.0000 -1009.0000  
-3290.0000 1263.0000  
-3290.0000 -1263.0000  
-13338.9000 0.0000  
CONSTANT 3.342691E+14

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.FNEB.HNZ****Coordinates (ERTS89)**

Latitude: 42.903080N

Country: France

Longitude: 2.106403E

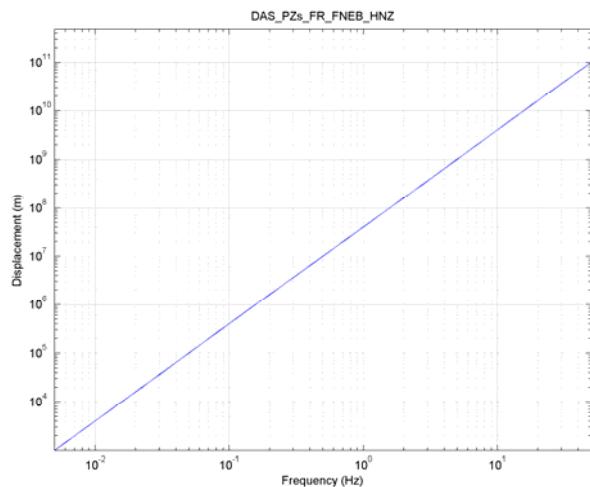
Municipality: Nébias

Elevation: 578 m

Owner: BRGM

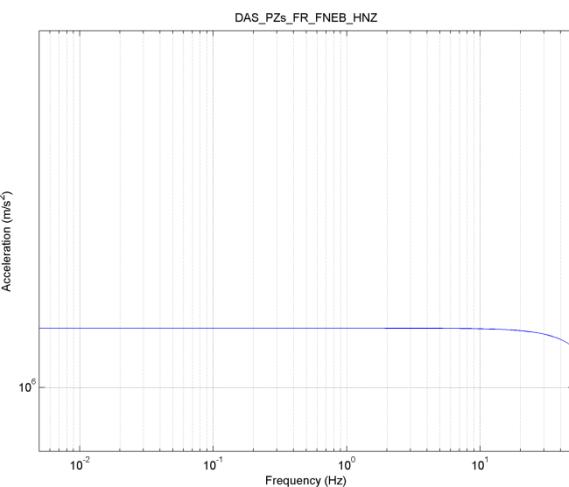
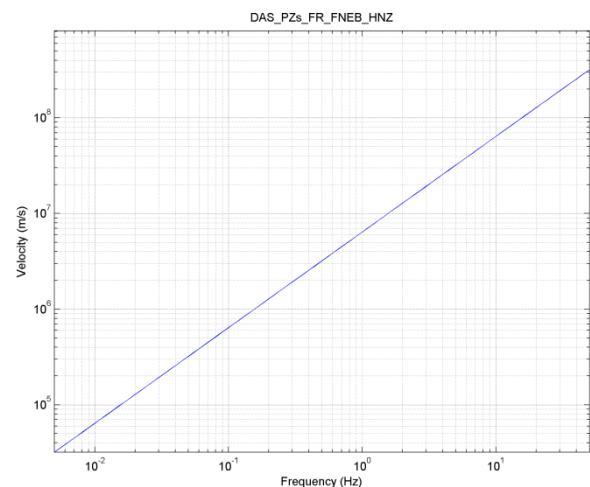
**Channel response**

Sensitivity	1.020360E+06
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	100



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-981.0000 1009.0000  
-981.0000 -1009.0000  
-3290.0000 1263.0000  
-3290.0000 -1263.0000  
-13338.9000 0.0000  
CONSTANT 3.342691E+14

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.GIRR.HNE****Coordinates (ERTS89)**

Latitude: 41.986028N

Country: Spain

Longitude: 2.827847E

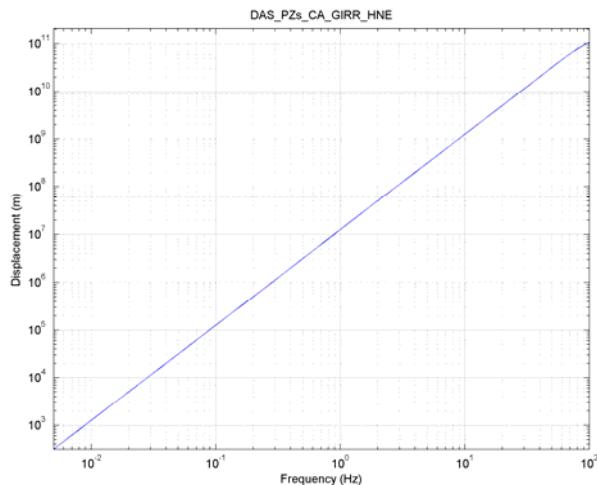
Municipality: Girona

Elevation: 102 m

Owner: IGN

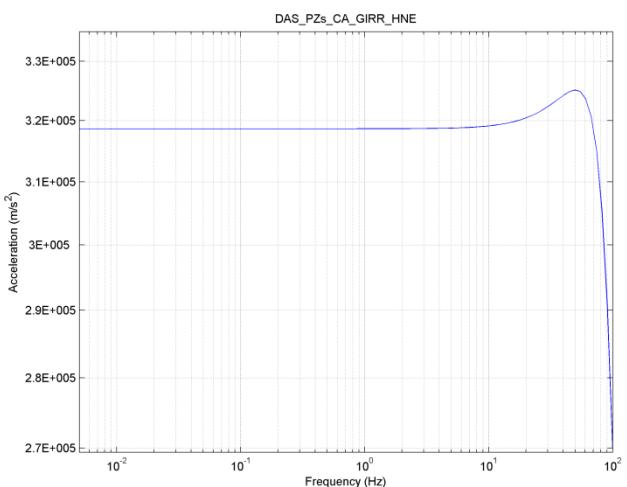
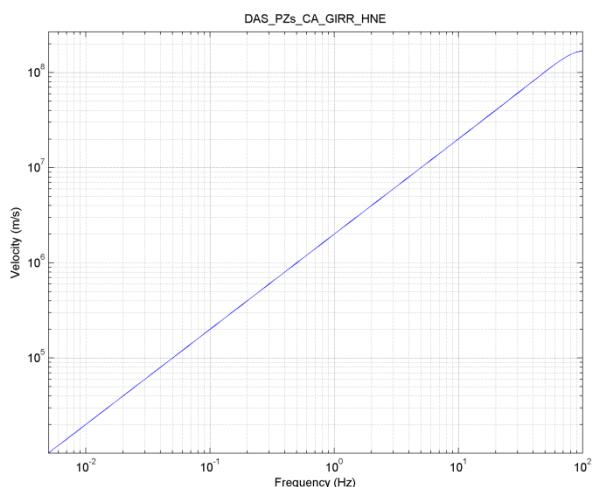
**Channel response**

Sensitivity	3.186528E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.632840E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.GIRR.HNN****Coordinates (ERTS89)**

Latitude: 41.986028N

Country: Spain

Longitude: 2.827847E

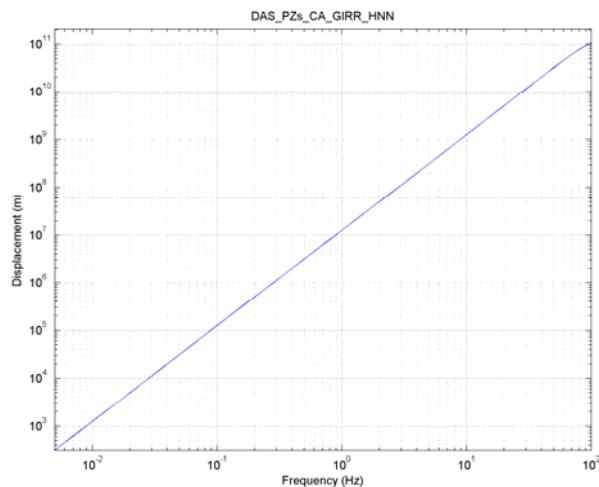
Municipality: Girona

Elevation: 102 m

Owner: IGN

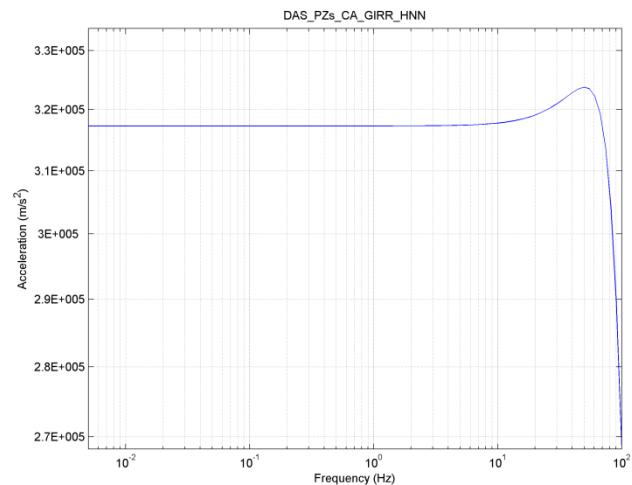
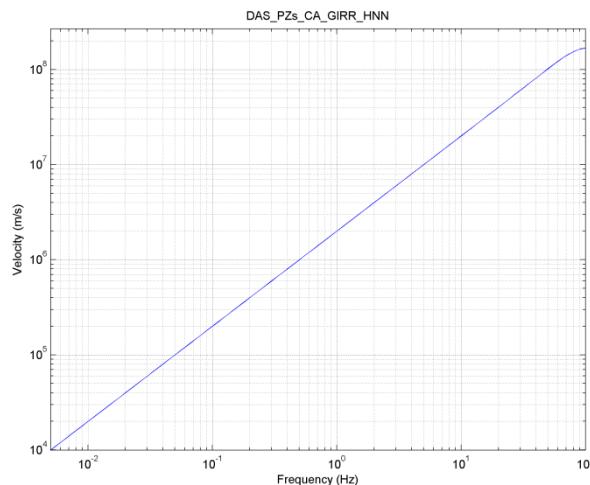
**Channel response**

Sensitivity	3.173108E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.592272E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.GIRR.HNZ****Coordinates (ERTS89)**

Latitude: 41.986028N

Country: Spain

Longitude: 2.827847E

Municipality: Girona

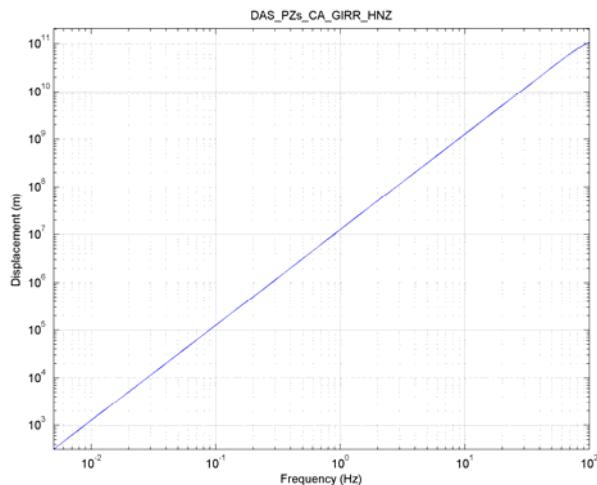
Elevation: 102 m

Owner: IGN

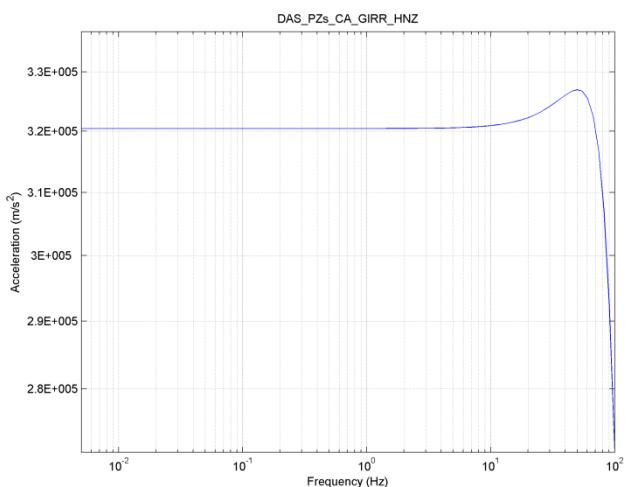
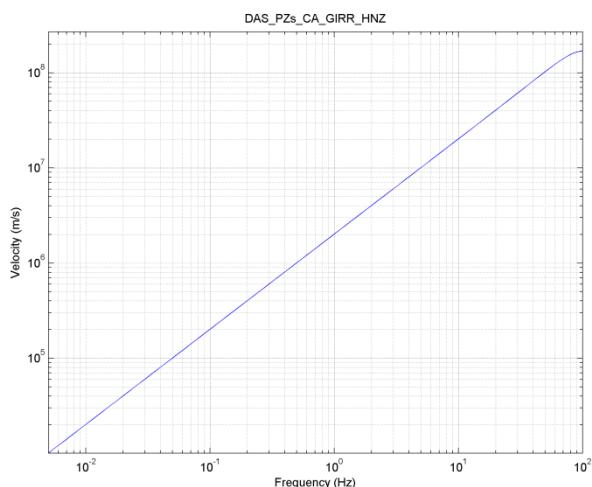
**Channel response**

Sensitivity	3.204500E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200

ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.687170E+8

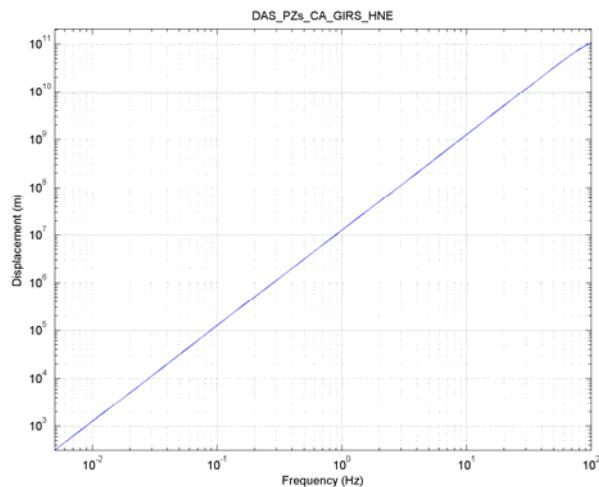


Amplitudes in nm and poles and zeros in rad/s



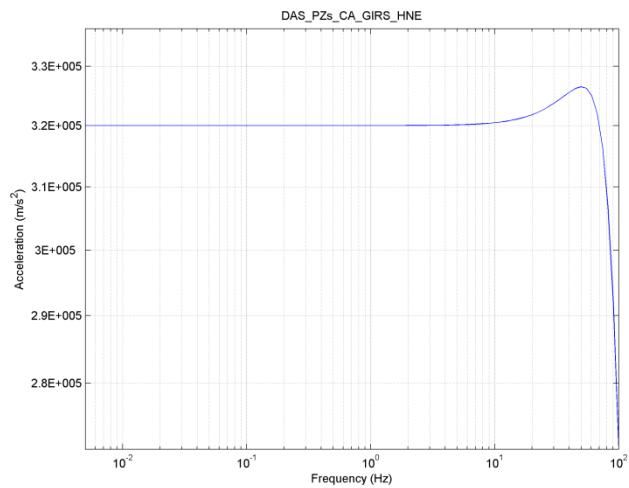
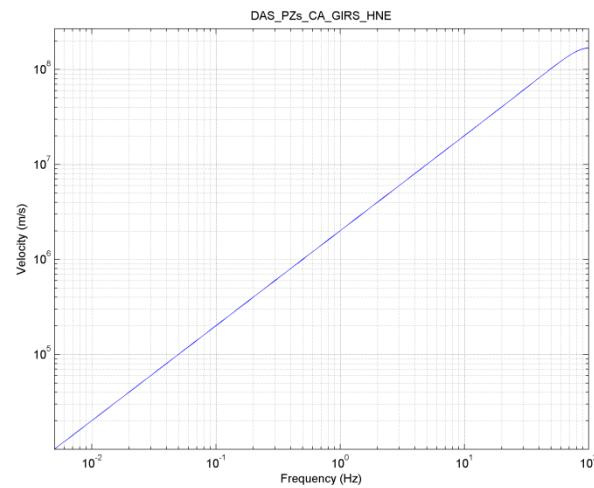
**NSCL code:****CA.GIRS.HNE****Coordinates (ERTS89)**Latitude: **41.980880N**Country: **Spain**Longitude: **2.821580E**Municipality: **Girona**Elevation: **70 m**Owner: **IGC****Channel response**

Sensitivity	<b>3.200299E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>200</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.674470E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.GIRS.HNN****Coordinates (ERTS89)**

Latitude: 41.980880N

Country: Spain

Longitude: 2.821580E

Municipality: Girona

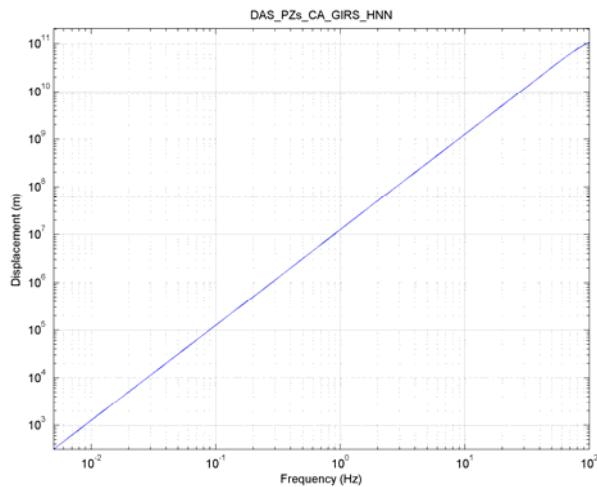
Elevation: 70 m

Owner: IGC

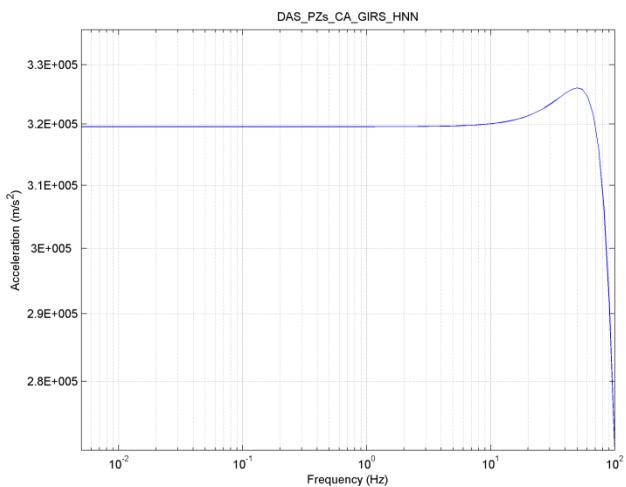
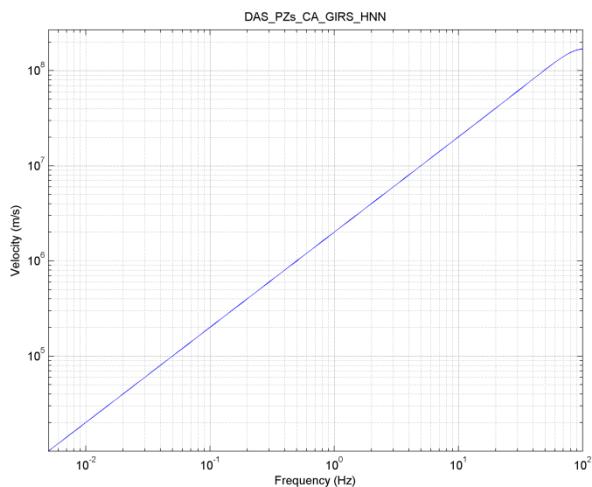
**Channel response**

Sensitivity	3.195830E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200

ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.660960E+8

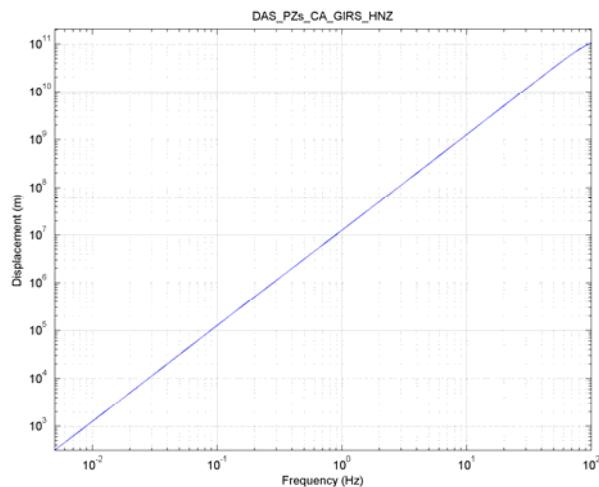


Amplitudes in nm and poles and zeros in rad/s



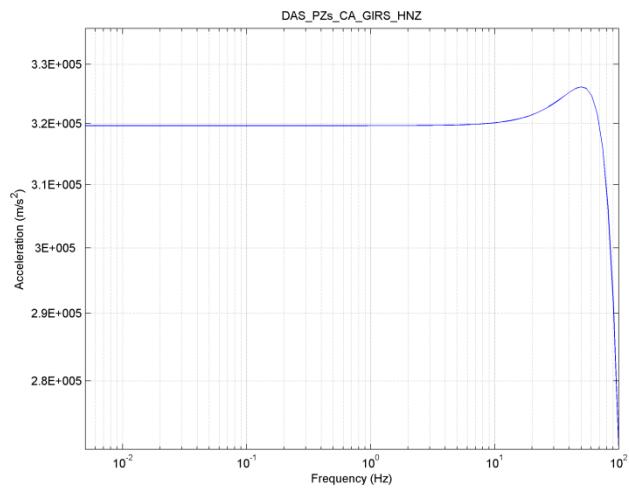
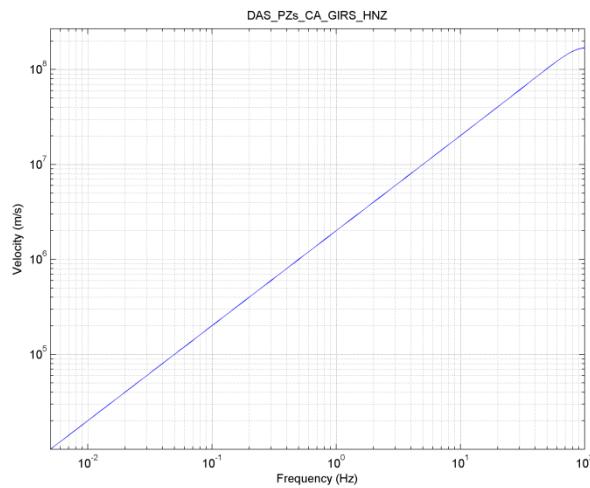
**NSCL code:****CA.GIRS.HNZ****Coordinates (ERTS89)**Latitude: **41.980880N**Country: **Spain**Longitude: **2.821580E**Municipality: **Girona**Elevation: **70 m**Owner: **IGC****Channel response**

Sensitivity	<b>3.196568E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>200</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.663191E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.GRAM.HNE****Coordinates (ERTS89)**

Latitude: 41.6070N

Country: Spain

Longitude: 2.2884E

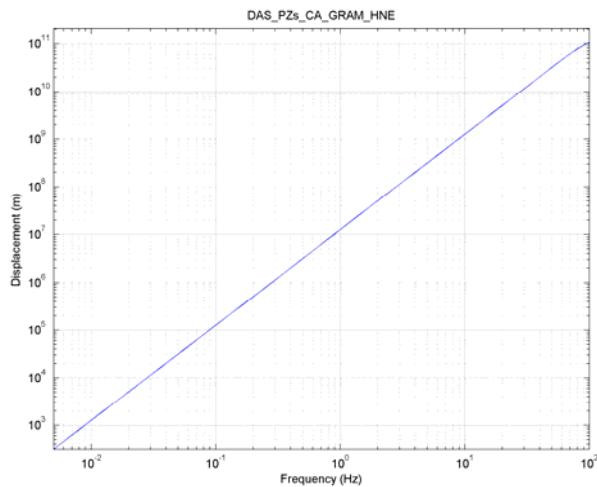
Municipality: Granollers

Elevation: 153 m

Owner: IGC

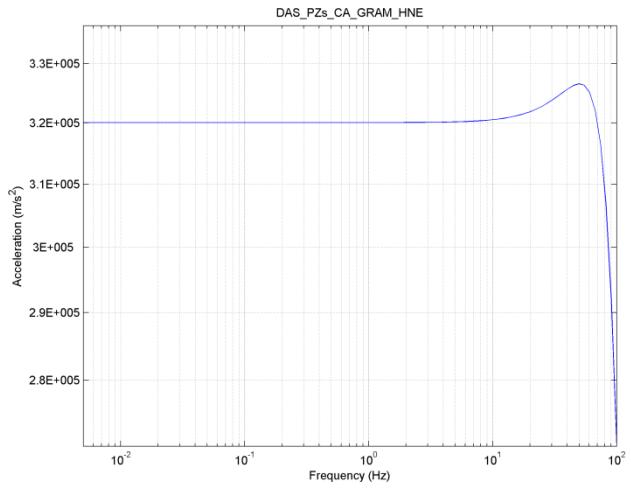
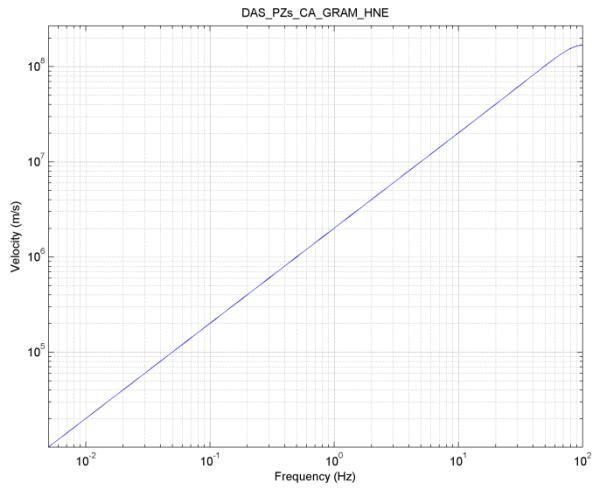
**Channel response**

Sensitivity	3.200522E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200



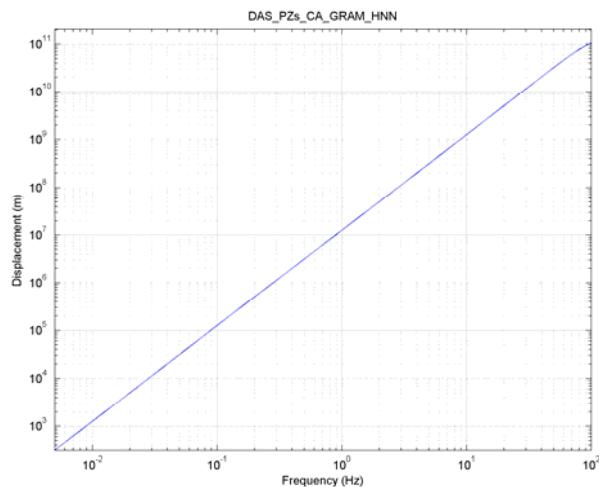
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.675144E+8

Amplitudes in nm and poles and zeros in rad/s



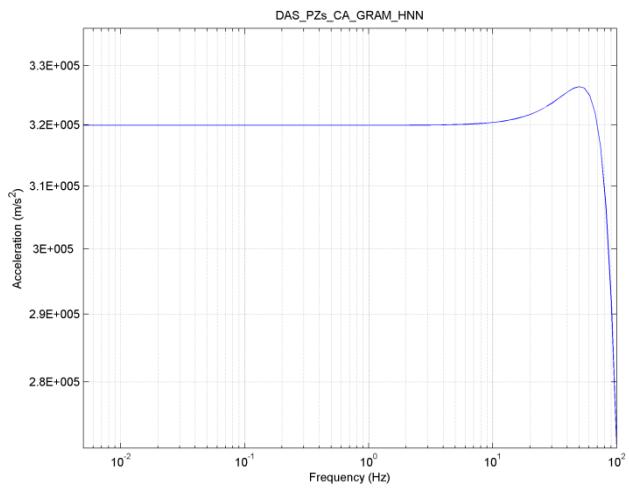
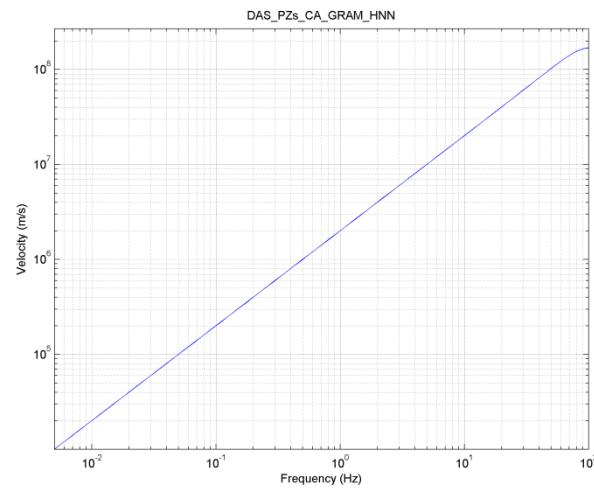
**NSCL code:****CA.GRAM.HNN****Coordinates (ERTS89)**Latitude: **41.6070N**Country: **Spain**Longitude: **2.2884E**Municipality: **Granollers**Elevation: **153 m**Owner: **IGC****Channel response**

Sensitivity	<b>3.199196E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>200</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.671136E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.GRAM.HNZ****Coordinates (ERTS89)**

Latitude: 41.6070N

Country: Spain

Longitude: 2.2884E

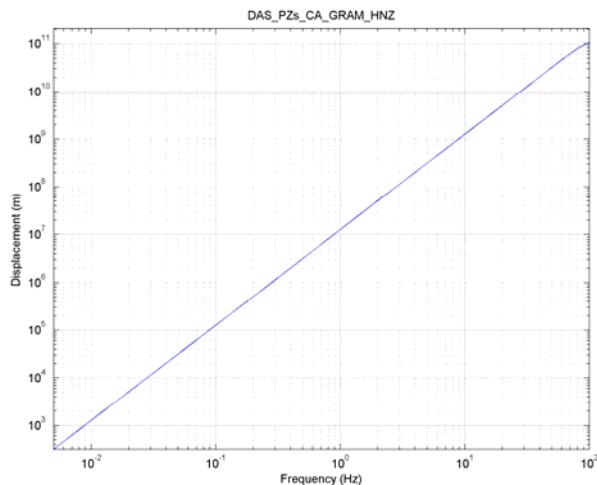
Municipality: Granollers

Elevation: 153 m

Owner: IGC

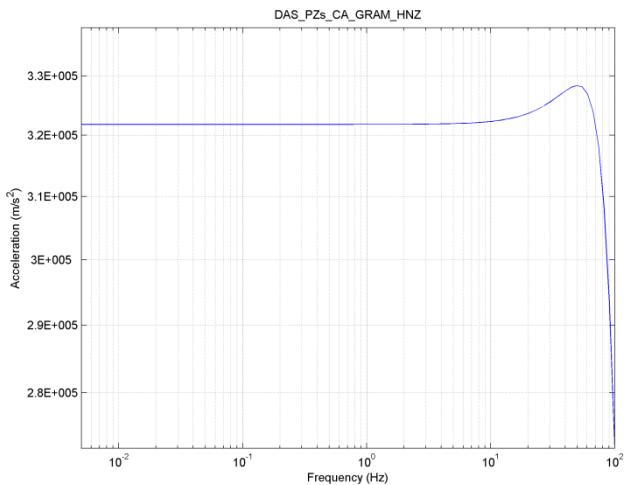
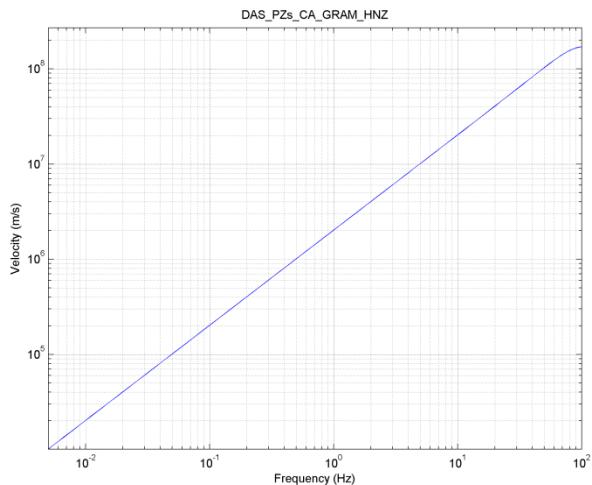
**Channel response**

Sensitivity	3.218145E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200



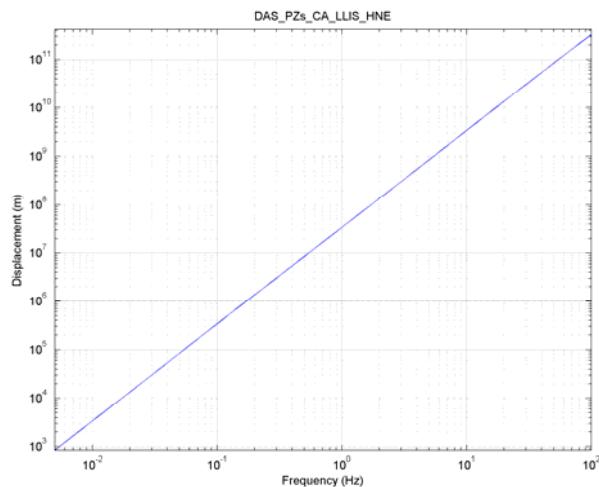
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.728418E+8

Amplitudes in nm and poles and zeros in rad/s



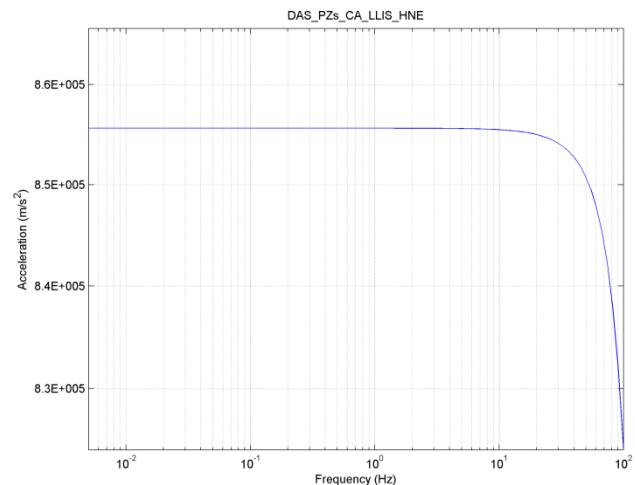
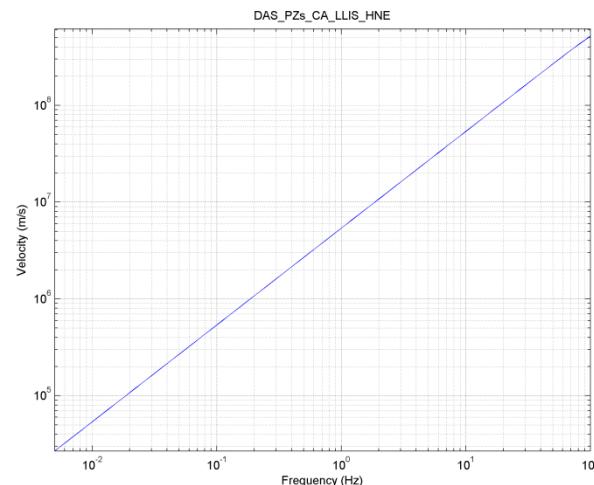
**NSCL code:****CA.LLIS.HNE****Coordinates (ERTS89)**Latitude: **42.4626N**Country: **Spain**Longitude: **1.9783E**Municipality: **Llívia**Elevation: **1198 m**Owner: **IGC****Channel response**

Sensitivity	<b>8.556380E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>100</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 -1009.0000  
-981.0000 1009.0000  
-3290.0000 -1263.0000  
-3290.0000 1263.0000  
CONSTANT 2.104498E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.LLIS.HNN****Coordinates (ERTS89)**

Latitude: 42.4626N

Country: Spain

Longitude: 1.9783E

Municipality: Llívia

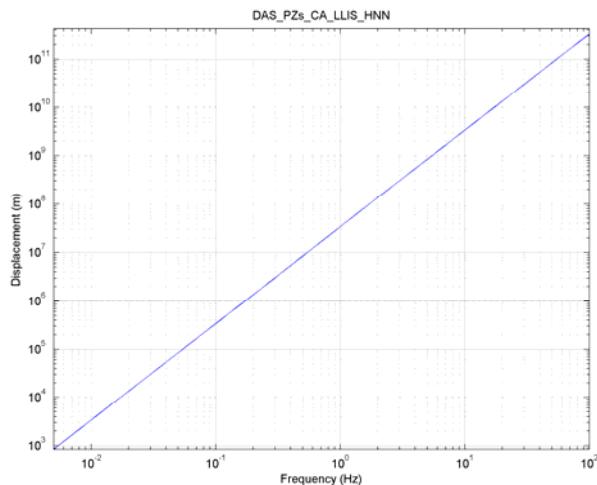
Elevation: 1198 m

Owner: IGC

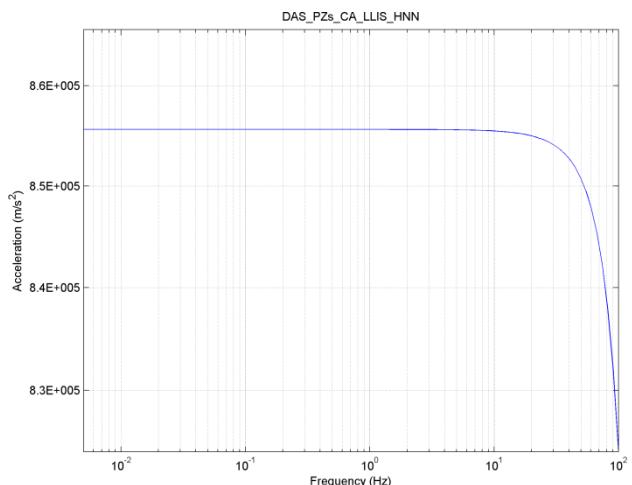
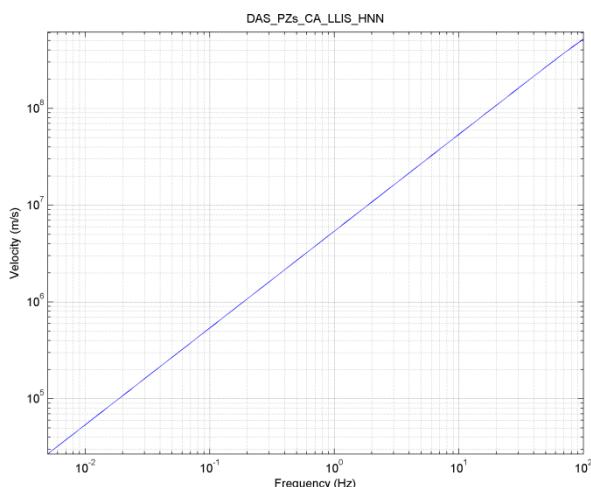
**Channel response**

Sensitivity	8.556380E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	100

ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 -1009.0000  
-981.0000 1009.0000  
-3290.0000 -1263.0000  
-3290.0000 1263.0000  
CONSTANT 2.104498E+10

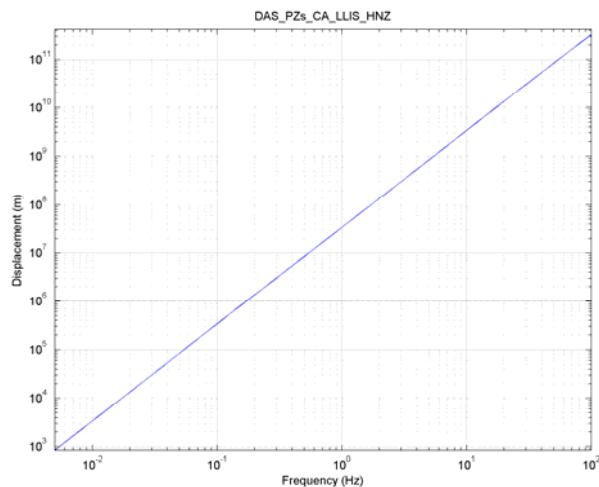


Amplitudes in nm and poles and zeros in rad/s



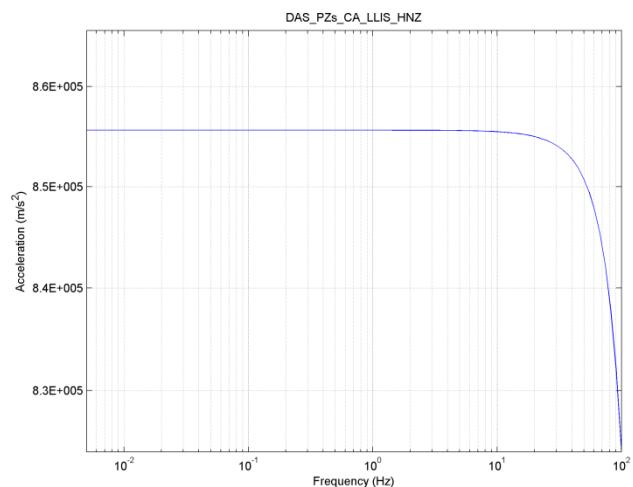
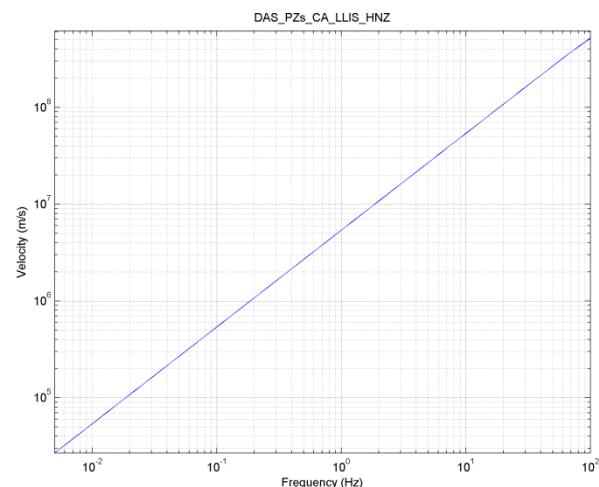
**NSCL code:****CA.LLIS.HNZ****Coordinates (ERTS89)**Latitude: **42.4626N**Country: **Spain**Longitude: **1.9783E**Municipality: **Llívia**Elevation: **1198 m**Owner: **IGC****Channel response**

Sensitivity	<b>8.556380E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>100</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 -1009.0000  
-981.0000 1009.0000  
-3290.0000 -1263.0000  
-3290.0000 1263.0000  
CONSTANT 2.104498E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.MLS.HHE.00****Coordinates (ERTS89)**

Latitude: 42.9578N

Country: France

Longitude: 1.0947E

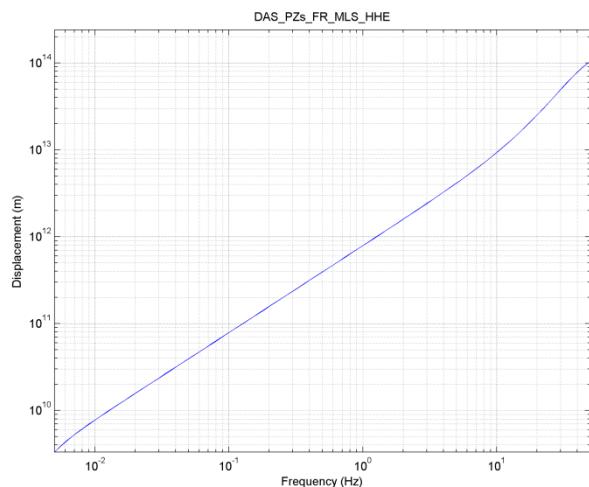
Municipality: Moulis

Elevation: 450 m

Owner: OMP

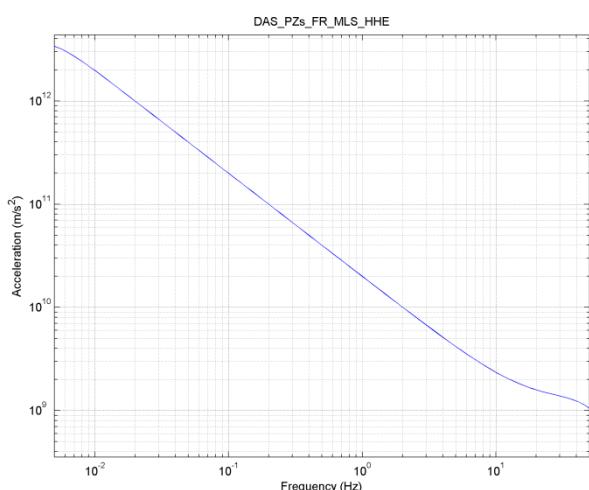
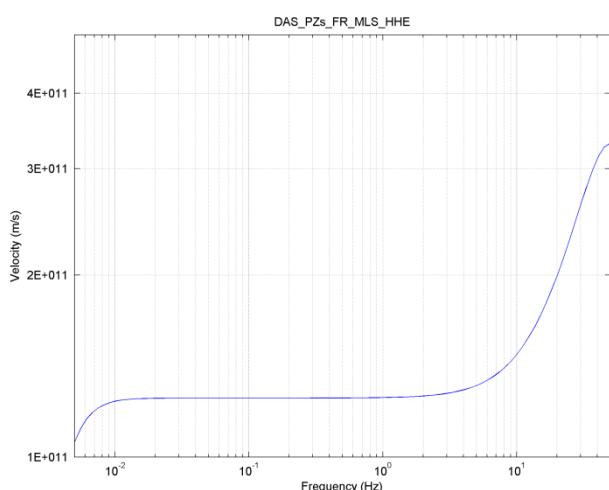
**Channel response**

Sensitivity	1.254350E+11
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 6  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-91.6591 0.0000  
-160.1000 0.0000  
-3207.0010 0.0000  
POLES 7  
-0.0176 -0.0176  
-0.0176 0.0176  
-126.7004 0.0000  
-192.1260 -259.0997  
-192.1260 259.0997  
-557.7018 -1142.9990  
-557.7018 1142.9990  
CONSTANT 5.671711E+7

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.MLS.HHN.00****Coordinates (ERTS89)**

Latitude: 42.9578N

Country: France

Longitude: 1.0947E

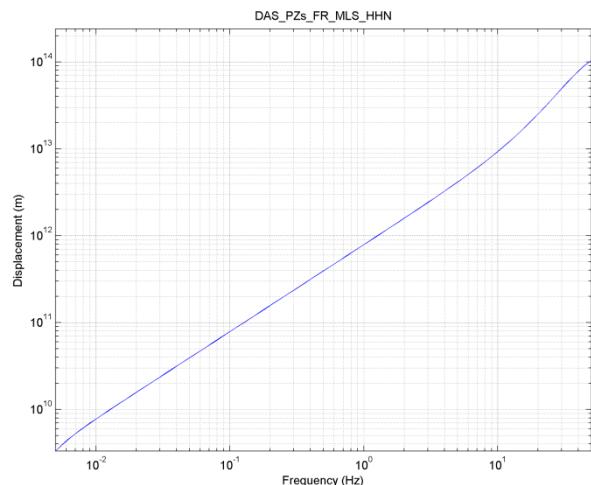
Municipality: Moulis

Elevation: 450 m

Owner: OMP

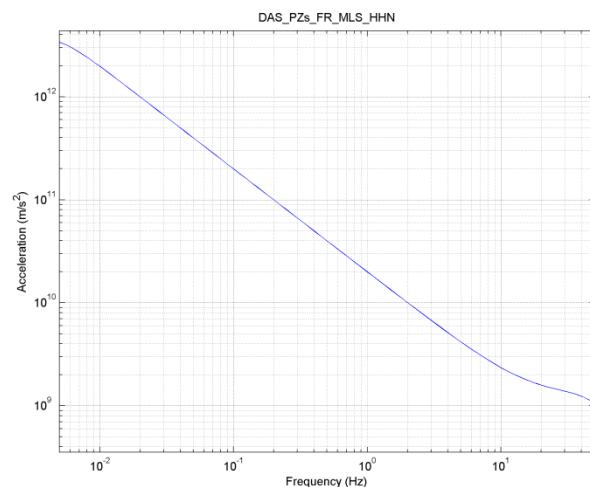
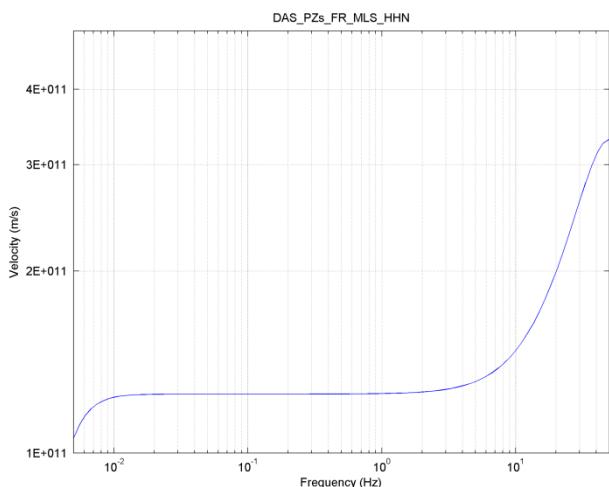
**Channel response**

Sensitivity	1.254350E+11
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 6  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-91.6591 0.0000  
-160.1000 0.0000  
-3207.0010 0.0000  
POLES 7  
-0.0176 -0.0176  
-0.0176 0.0176  
-126.7004 0.0000  
-192.1260 -259.0997  
-192.1260 259.0997  
-557.7018 -1142.9990  
-557.7018 1142.9990  
CONSTANT 5.671711E+7

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.MLS.HHZ.00****Coordinates (ERTS89)**

Latitude: 42.9578N

Country: France

Longitude: 1.0947E

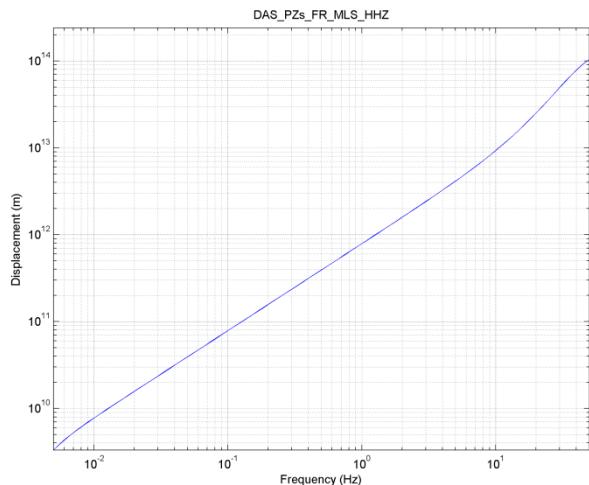
Municipality: Moulis

Elevation: 450 m

Owner: OMP

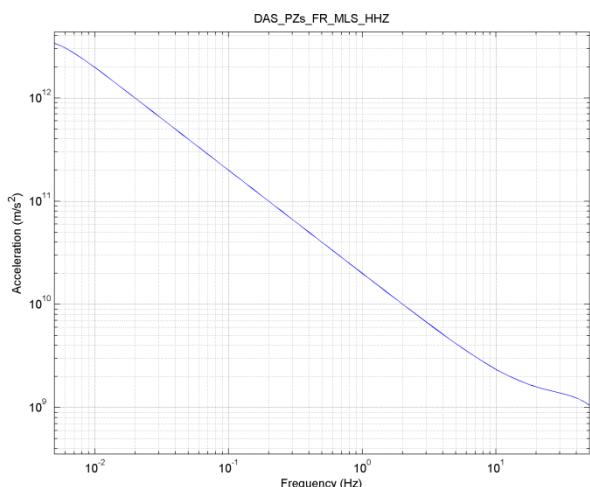
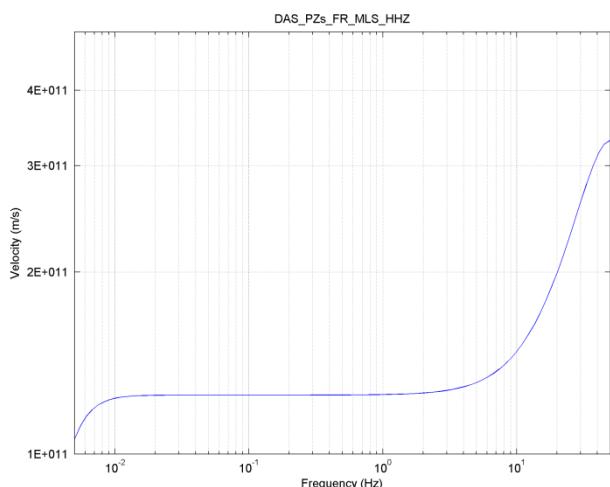
**Channel response**

Sensitivity	1.254350E+11
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 6  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-91.6591 0.0000  
-160.1000 0.0000  
-3207.0010 0.0000  
POLES 7  
-0.0176 -0.0176  
-0.0176 0.0176  
-126.7004 0.0000  
-192.1260 -259.0997  
-192.1260 259.0997  
-557.7018 -1142.9990  
-557.7018 1142.9990  
CONSTANT 5.671711E+7

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.OLOS.HNE****Coordinates (ERTS89)**

Latitude: 42.181450N

Country: Spain

Longitude: 2.489250E

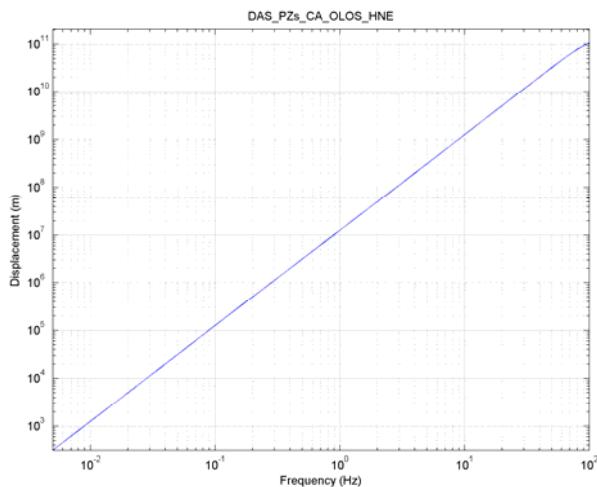
Municipality: Olot

Elevation: 436 m

Owner: IGN

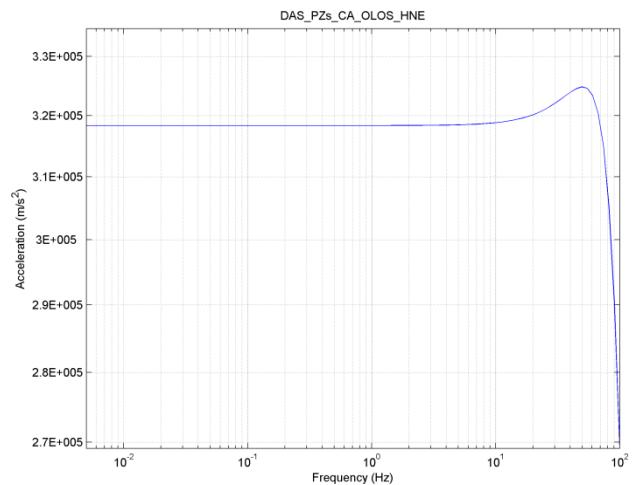
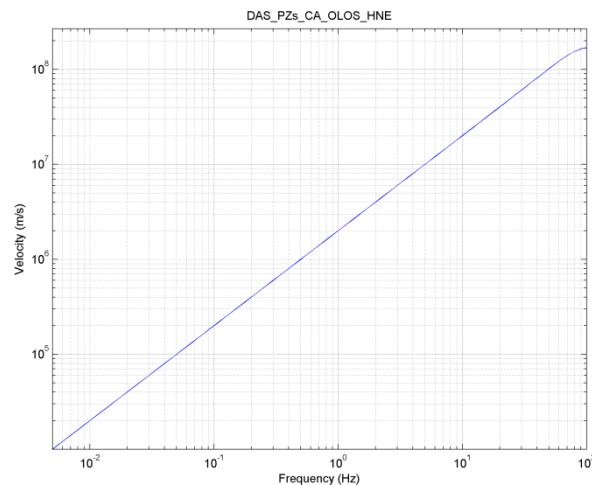
**Channel response**

Sensitivity	3.183591E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.623962E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.OLOS.HNN****Coordinates (ERTS89)**

Latitude: 42.181450N

Country: Spain

Longitude: 2.489250E

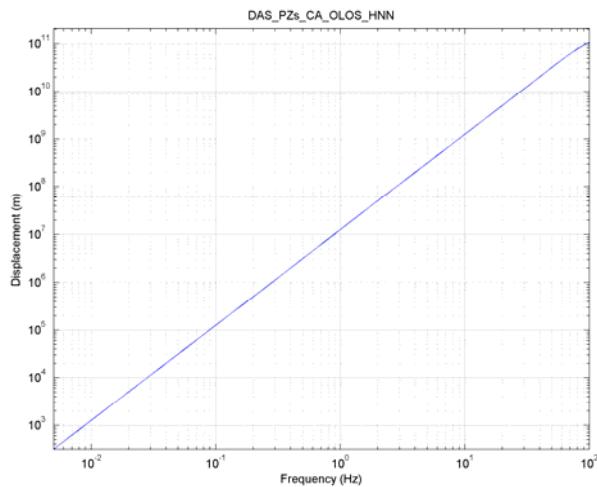
Municipality: Olot

Elevation: 436 m

Owner: IGN

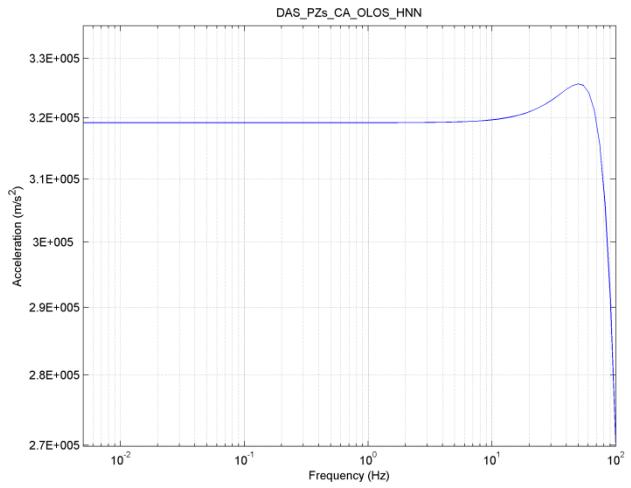
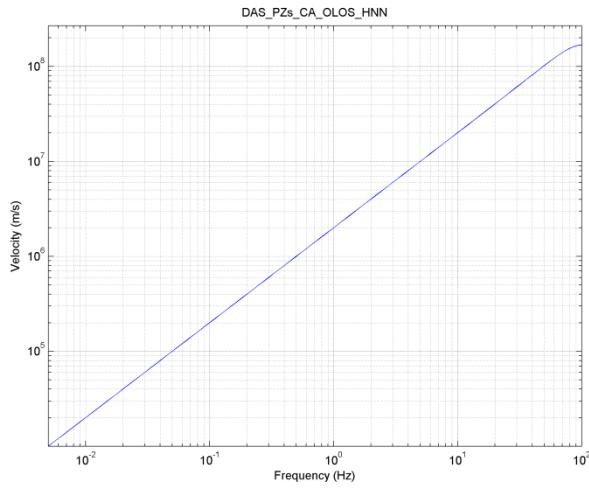
**Channel response**

Sensitivity	3.191917E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.649131E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.OLOS.HNZ****Coordinates (ERTS89)**

Latitude: 42.181450N

Country: Spain

Longitude: 2.489250E

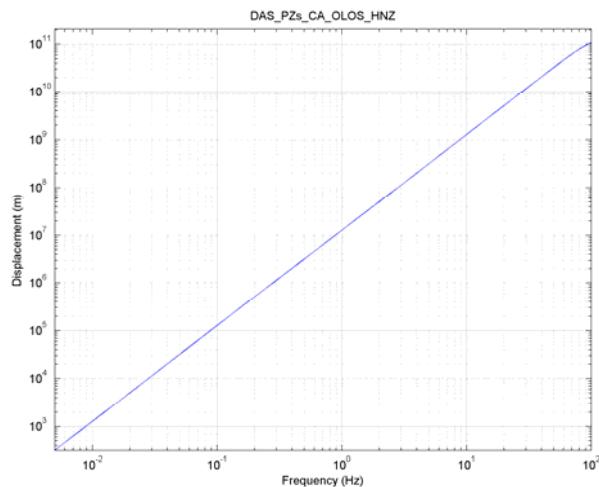
Municipality: Olot

Elevation: 436 m

Owner: IGN

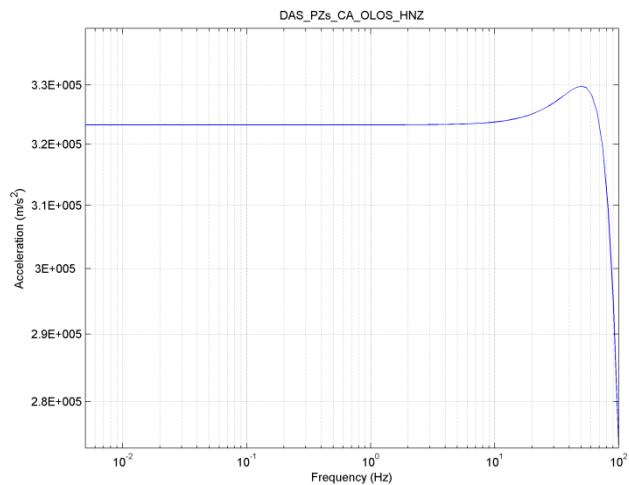
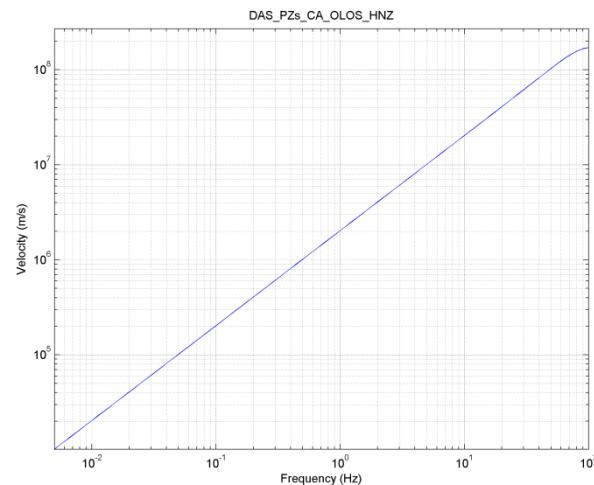
**Channel response**

Sensitivity	3.232562E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.771892E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYAD.HNE.00****Coordinates (ERTS89)**

Latitude: 43.0975N

Country: France

Longitude: 0.4258W

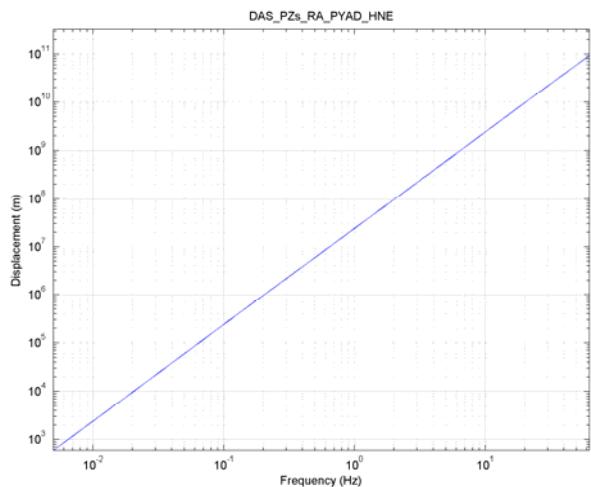
Municipality: Arudy

Elevation: 450 m

Owner: OMP

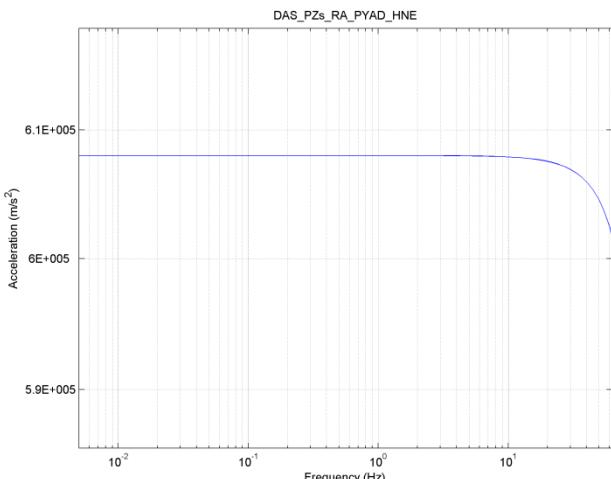
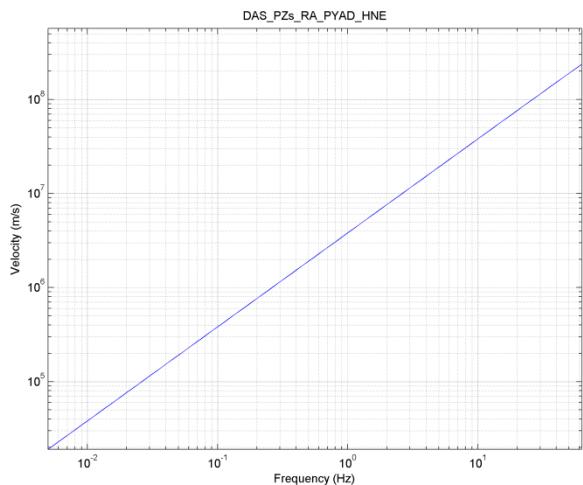
**Channel response**

Sensitivity	6.080050E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



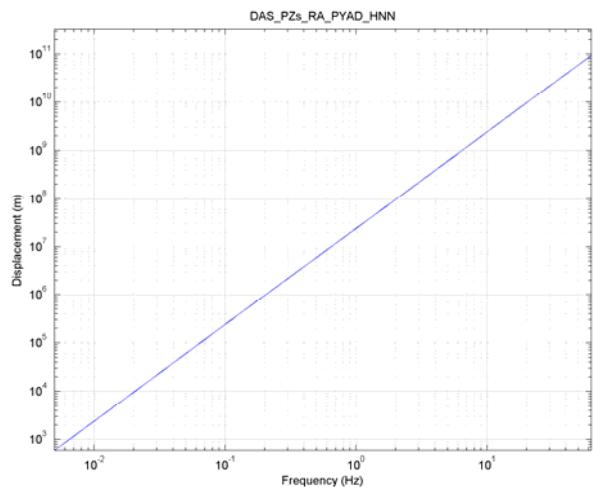
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.495452E+10

Amplitudes in nm and poles and zeros in rad/s



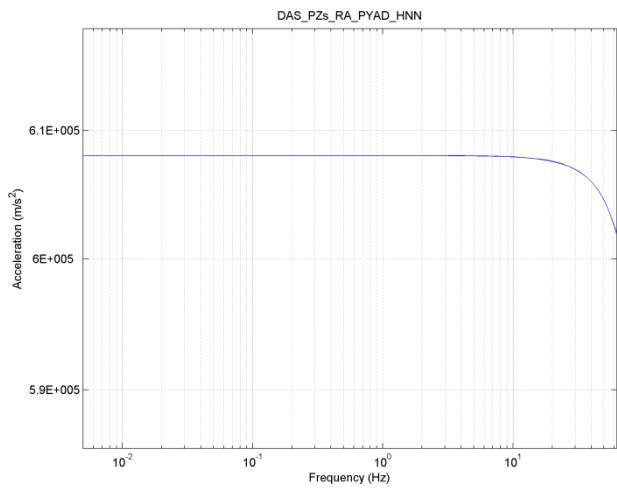
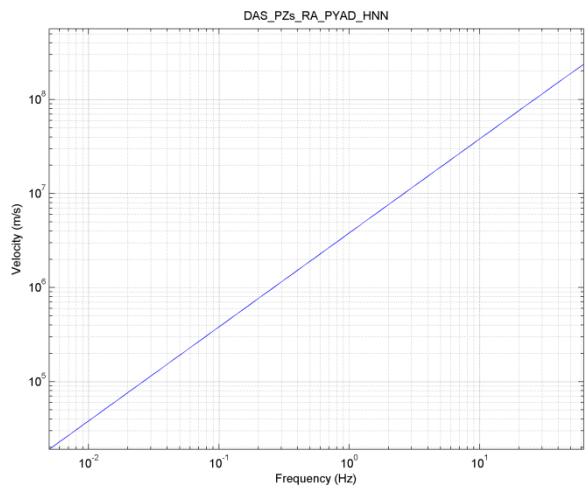
**NSCL code:****RA.PYAD.HNN.00****Coordinates (ERTS89)**Latitude: **43.0975N**Country: **France**Longitude: **0.4258W**Municipality: **Arudy**Elevation: **450 m**Owner: **OMP****Channel response**

Sensitivity	<b>6.080300E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>125</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.495513E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYAD.HNZ.00****Coordinates (ERTS89)**

Latitude: 43.0975N

Country: France

Longitude: 0.4258W

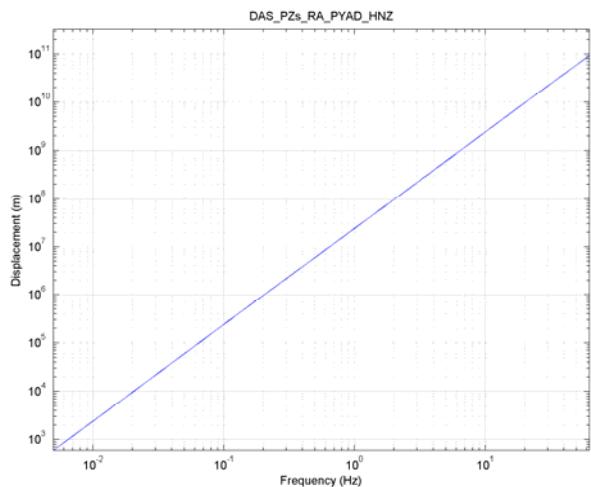
Municipality: Arudy

Elevation: 450 m

Owner: OMP

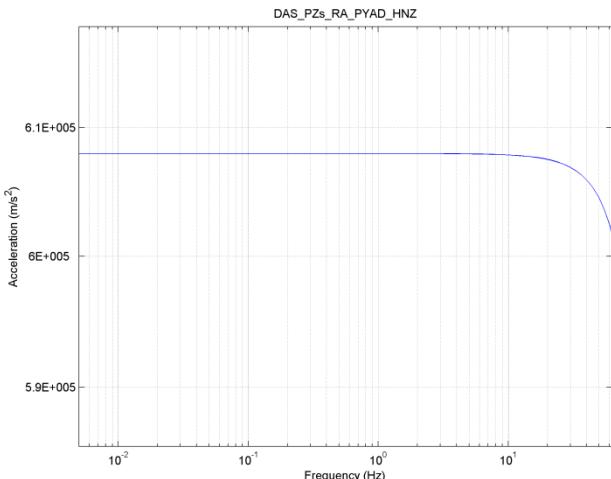
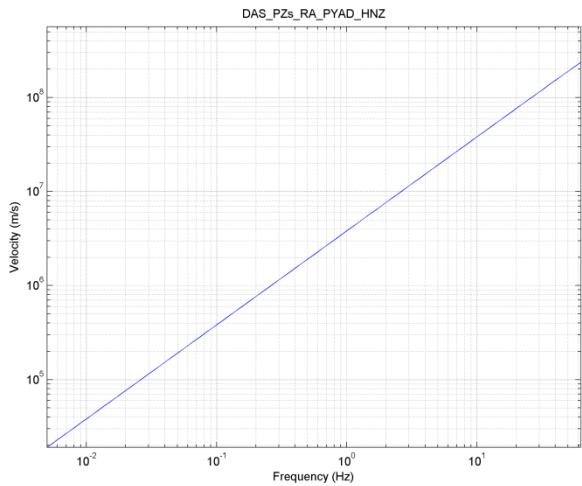
**Channel response**

Sensitivity	6.079810E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.495392E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYAS.HNE.00****Coordinates (ERTS89)**

Latitude: 43.0119N

Country: France

Longitude: 0.7973E

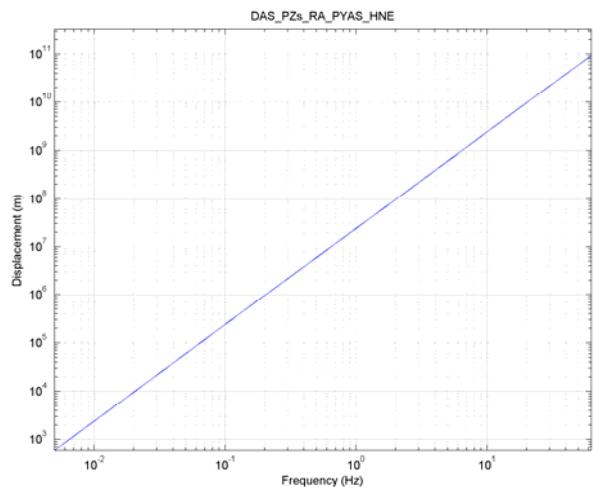
Municipality: Aspet

Elevation: 430 m

Owner: BRGM

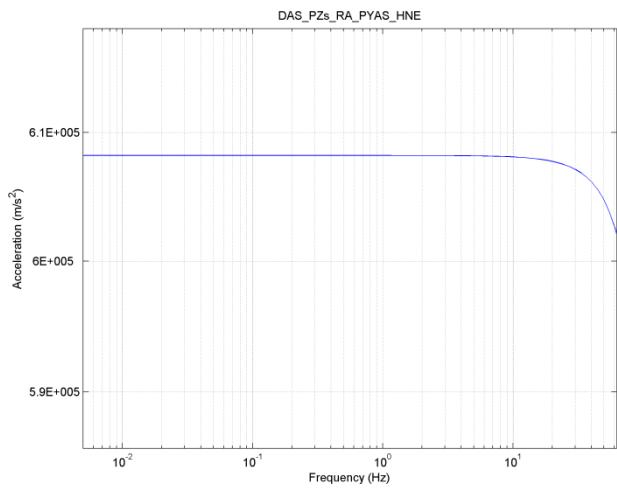
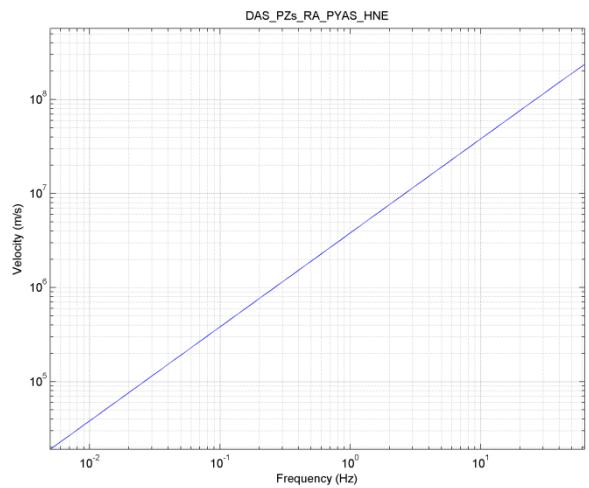
**Channel response**

Sensitivity	6.081990E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.495929E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYAS.HNN.00****Coordinates (ERTS89)**

Latitude: 43.0119N

Country: France

Longitude: 0.7973E

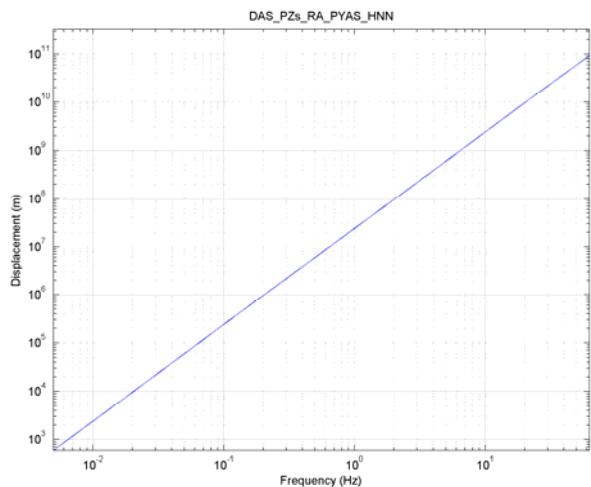
Municipality: Aspet

Elevation: 430 m

Owner: BRGM

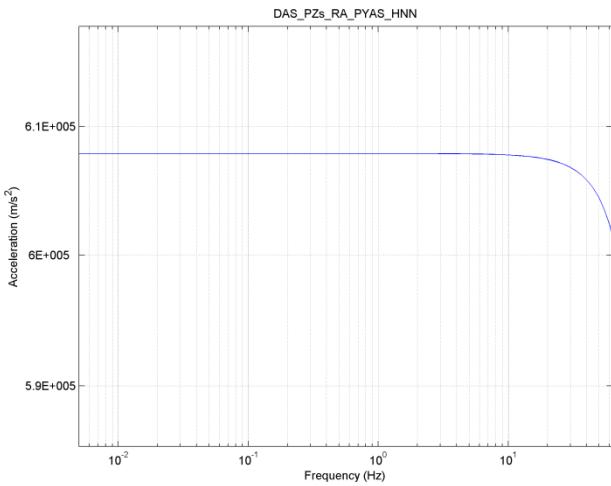
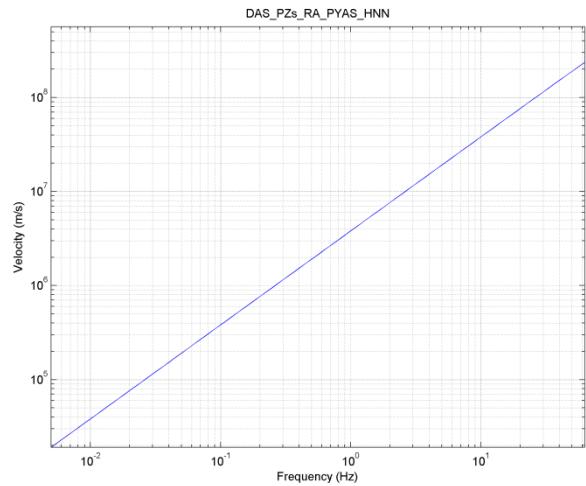
**Channel response**

Sensitivity	6.078830E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.495151E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYAS.HNZ.00****Coordinates (ERTS89)**

Latitude: 43.0119N

Country: France

Longitude: 0.7973E

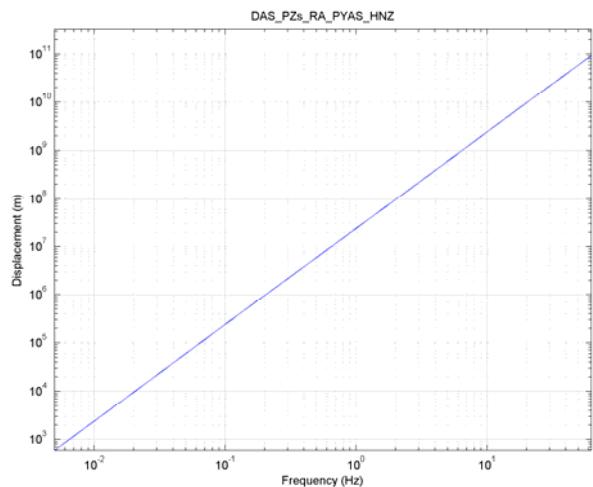
Municipality: Aspet

Elevation: 430 m

Owner: BRGM

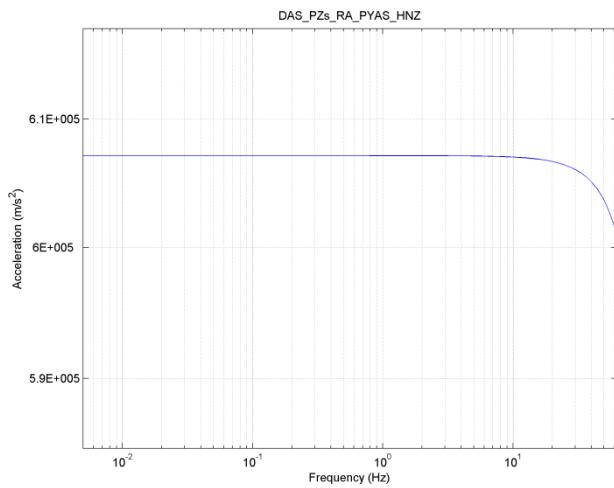
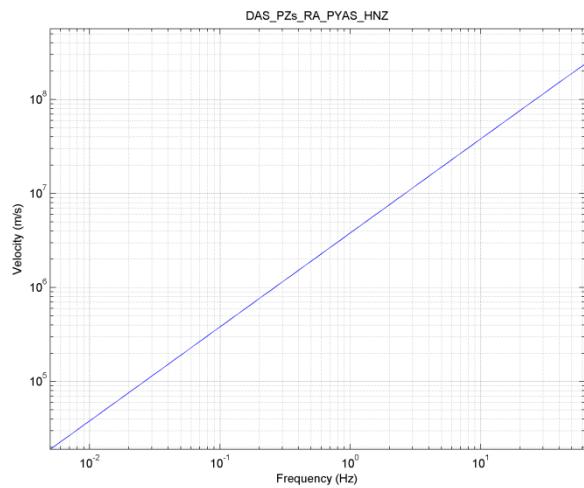
**Channel response**

Sensitivity	6.071300E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.493299E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYBA.HNE.00****Coordinates (ERTS89)**

Latitude: 42.4740N

Country: France

Longitude: 3.1170E

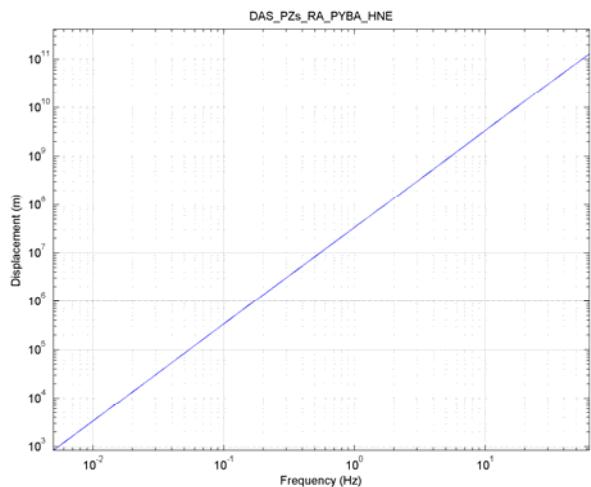
Municipality: Banyuls

Elevation: 70 m

Owner: BRGM

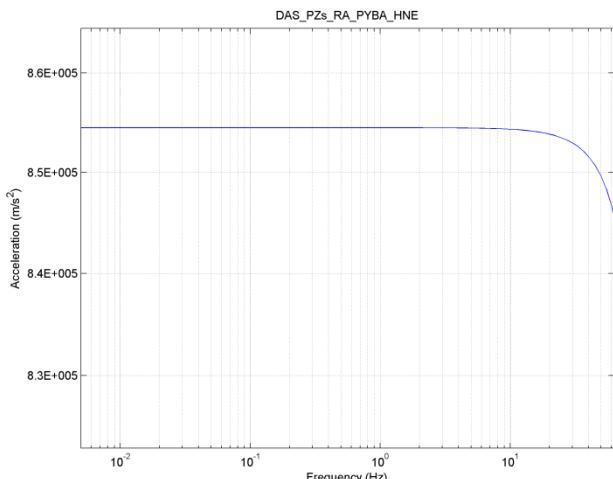
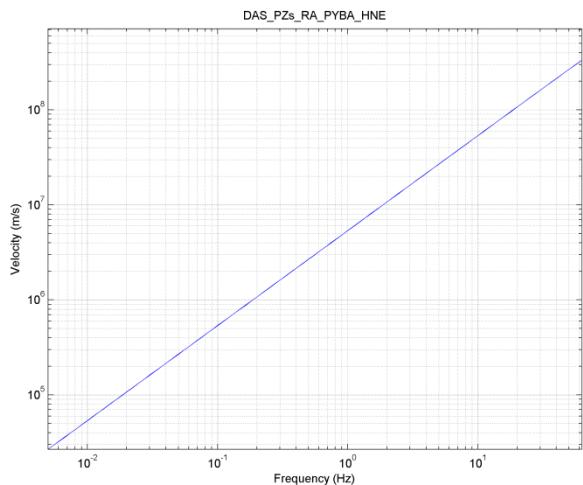
**Channel response**

Sensitivity	8.544920E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



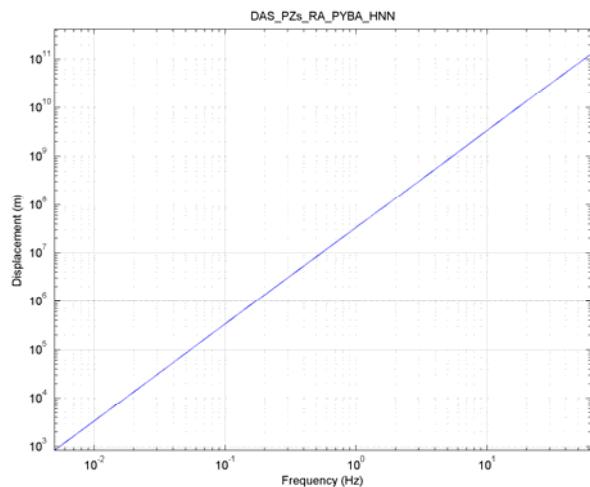
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 2.101712E+10

Amplitudes in nm and poles and zeros in rad/s



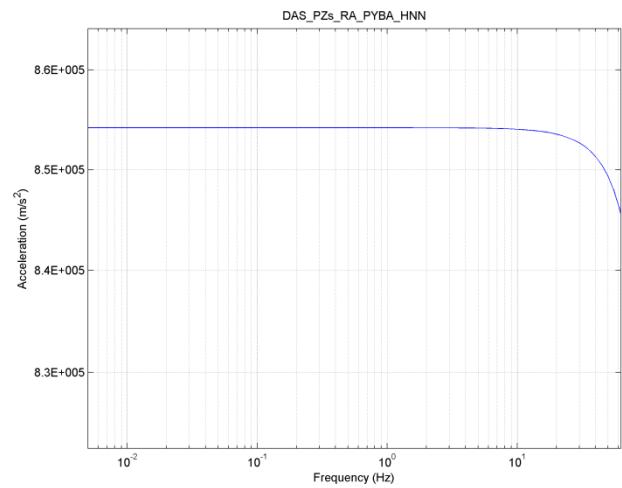
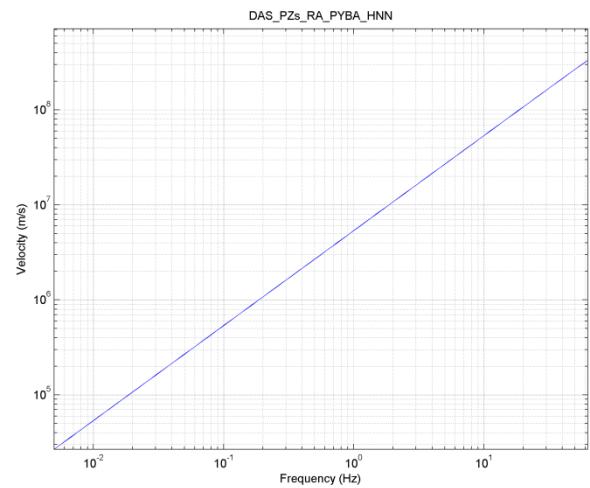
**NSCL code:****RA.PYBA.HNN.00****Coordinates (ERTS89)**Latitude: **42.4740N**Country: **France**Longitude: **3.1170E**Municipality: **Banyuls**Elevation: **70 m**Owner: **BRGM****Channel response**

Sensitivity	<b>8.541850E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>125</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 2.100957E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYBA.HNZ.00****Coordinates (ERTS89)**

Latitude: 42.4740N

Country: France

Longitude: 3.1170E

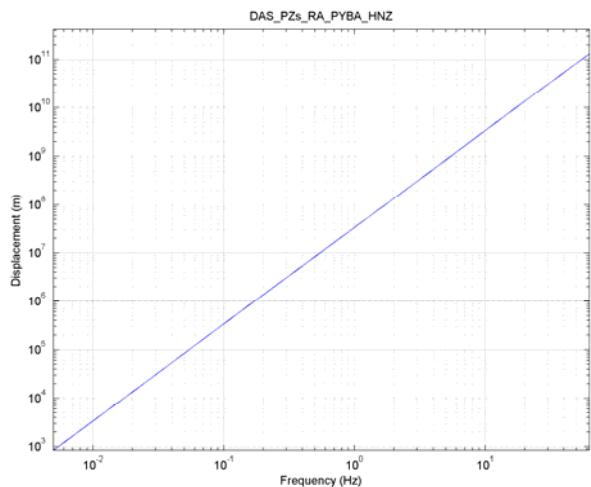
Municipality: Banyuls

Elevation: 70 m

Owner: BRGM

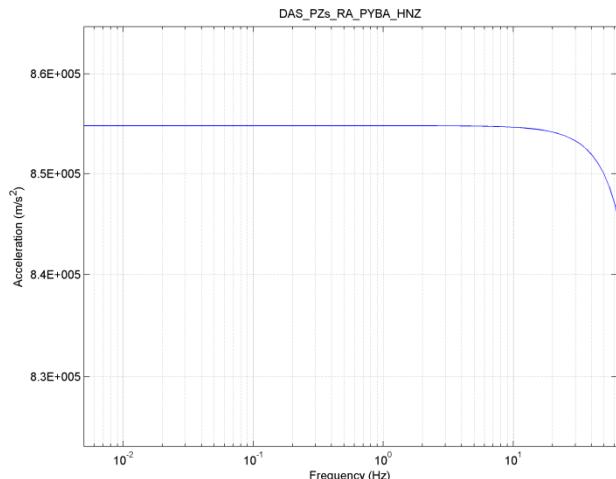
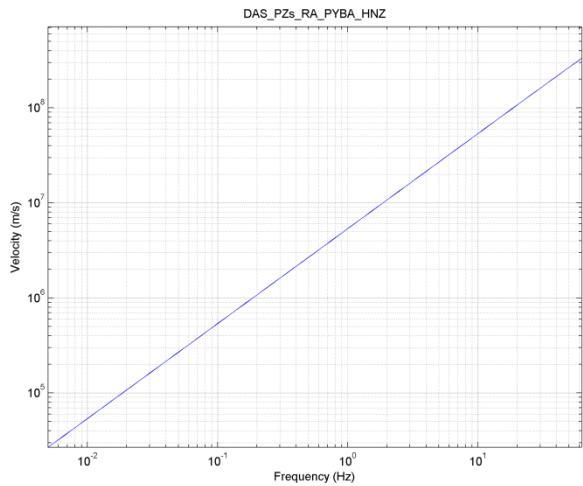
**Channel response**

Sensitivity	8.548010E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 2.102472E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYBB.HNE.00****Coordinates (ERTS89)**

Latitude: 43.0586N

Country: France

Longitude: 0.1489E

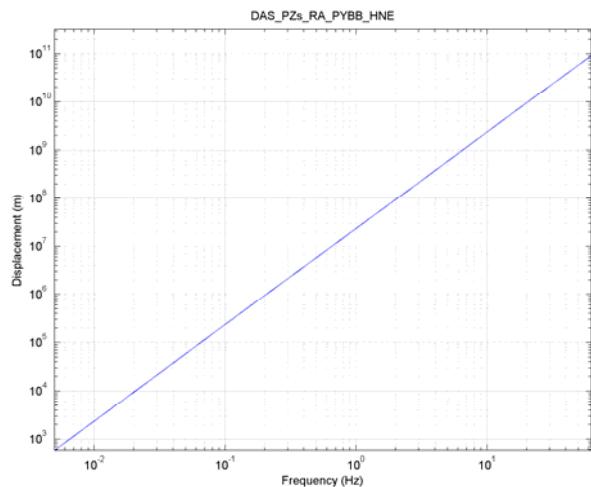
Municipality: Bargnères

Elevation: 567 m

Owner: OMP

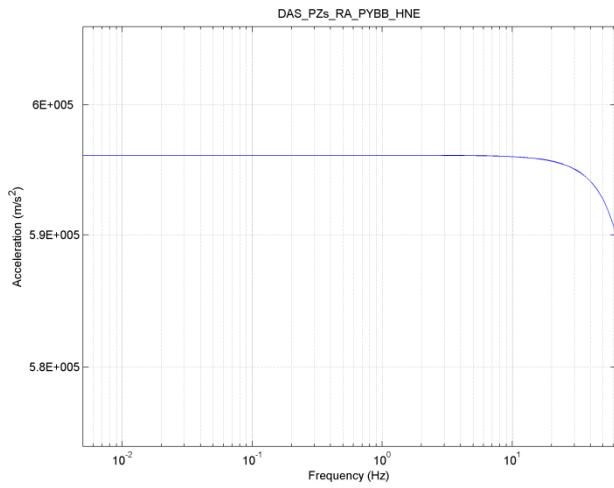
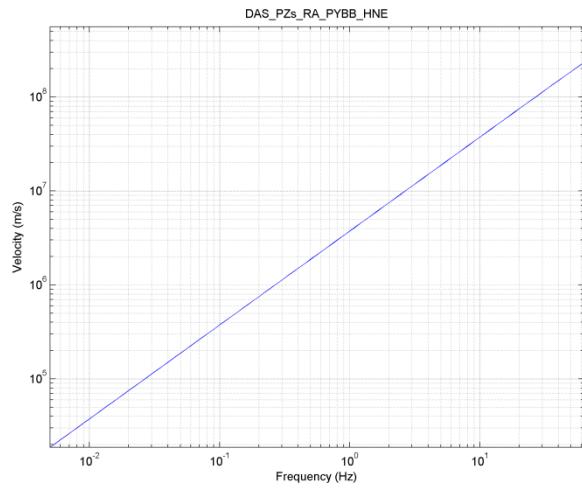
**Channel response**

Sensitivity	5.960950E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.466158E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYBB.HNN.00****Coordinates (ERTS89)**

Latitude: 43.0586N

Country: France

Longitude: 0.1489E

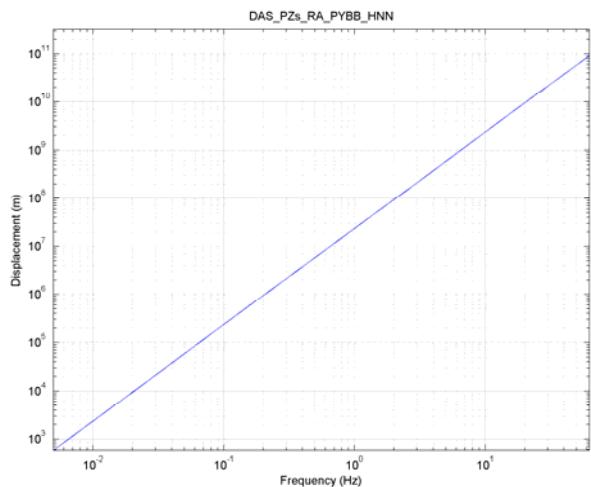
Municipality: Bargnères

Elevation: 567 m

Owner: OMP

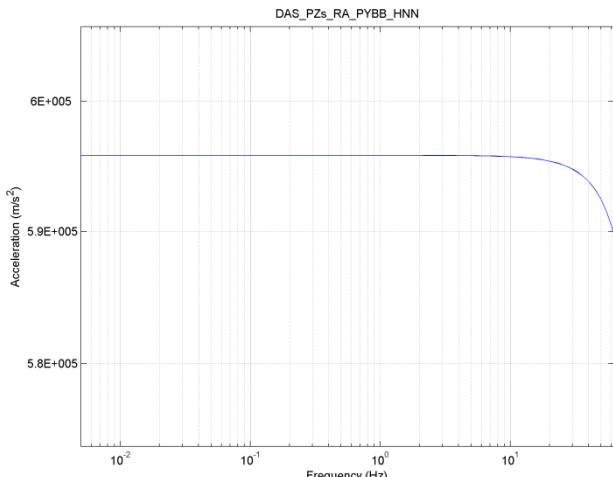
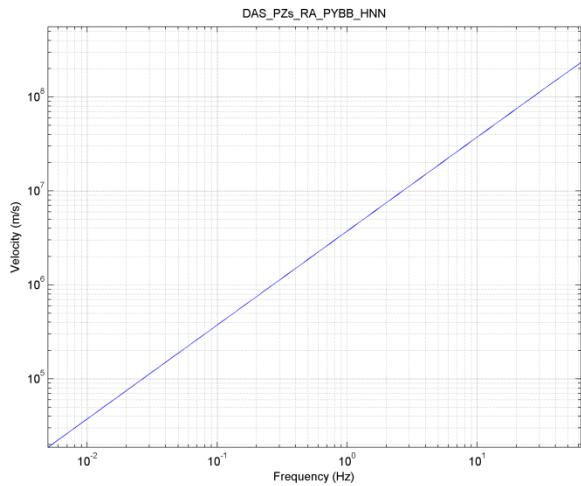
**Channel response**

Sensitivity	5.958330E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.465513E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYBB.HNZ.00****Coordinates (ERTS89)**

Latitude: 43.0586N

Country: France

Longitude: 0.1489E

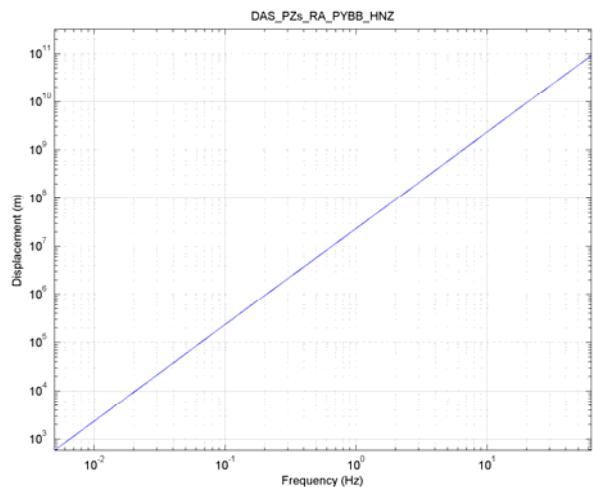
Municipality: Bargnères

Elevation: 567 m

Owner: OMP

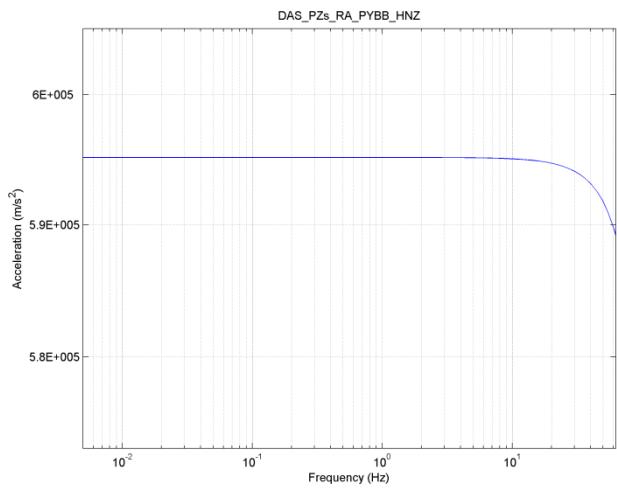
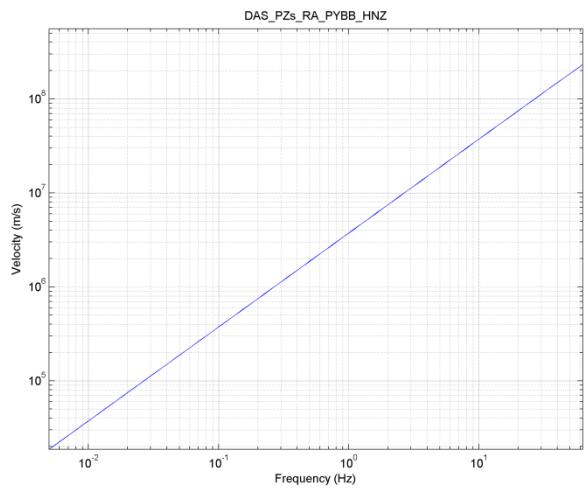
**Channel response**

Sensitivity	5.951660E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.463873E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYFO.HNE.00****Coordinates (ERTS89)**

Latitude: 42.9680N

Country: France

Longitude: 1.6070E

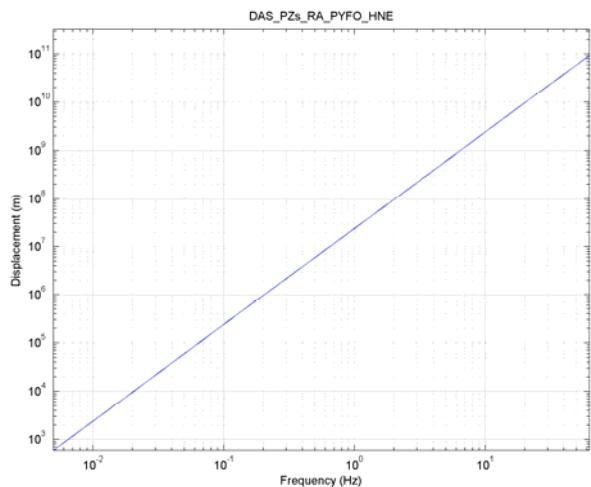
Municipality: Foix

Elevation: 380 m

Owner: BRGM

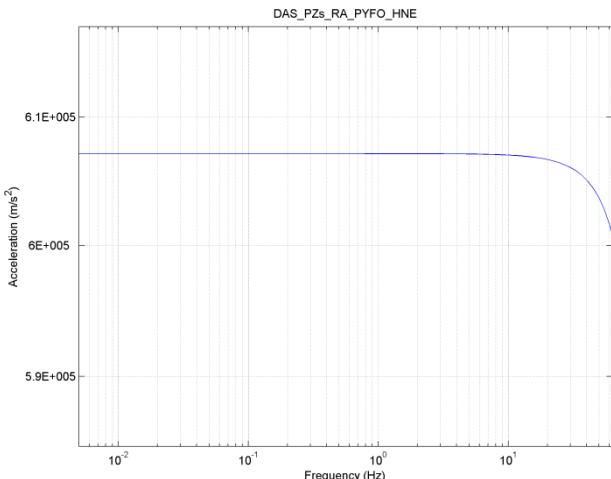
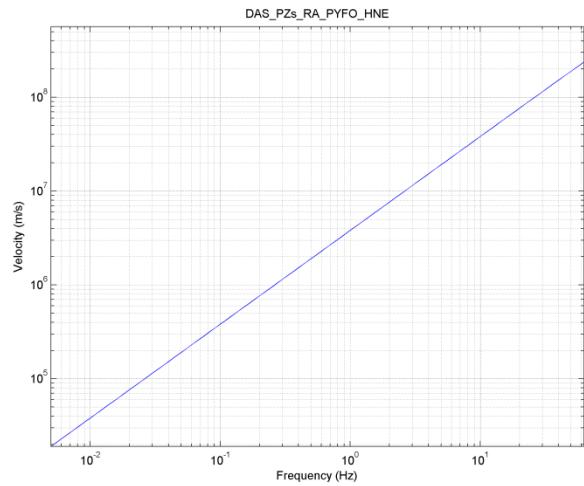
**Channel response**

Sensitivity	6.071300E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.493299E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYFO.HNN.00****Coordinates (ERTS89)**

Latitude: 42.9680N

Country: France

Longitude: 1.6070E

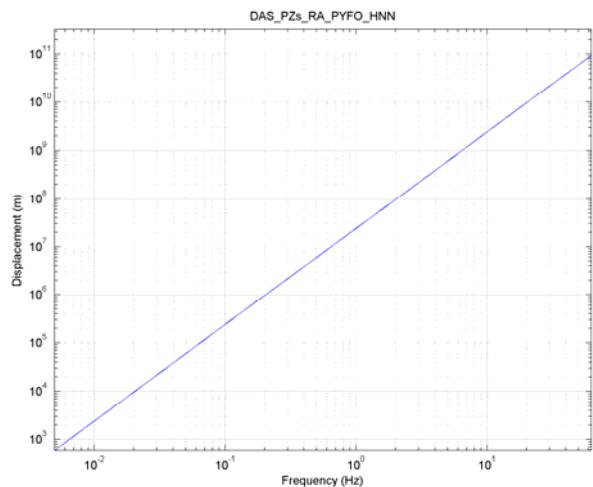
Municipality: Foix

Elevation: 380 m

Owner: BRGM

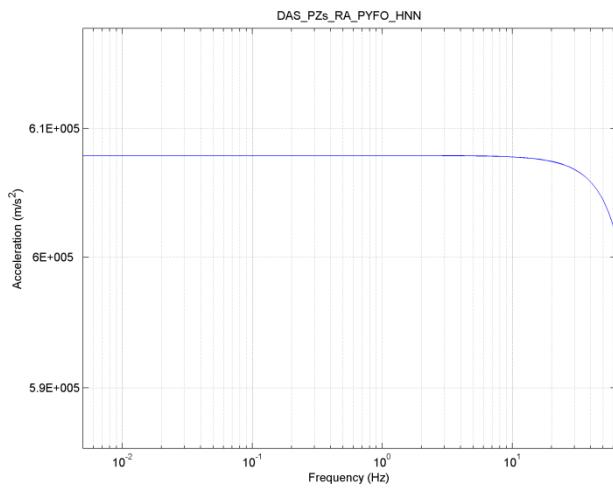
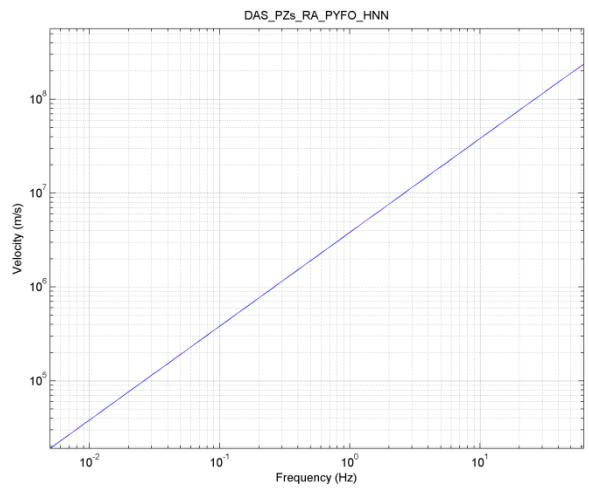
**Channel response**

Sensitivity	6.078830E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.495151E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYFO.HNZ.00****Coordinates (ERTS89)**

Latitude: 42.9680N

Country: France

Longitude: 1.6070E

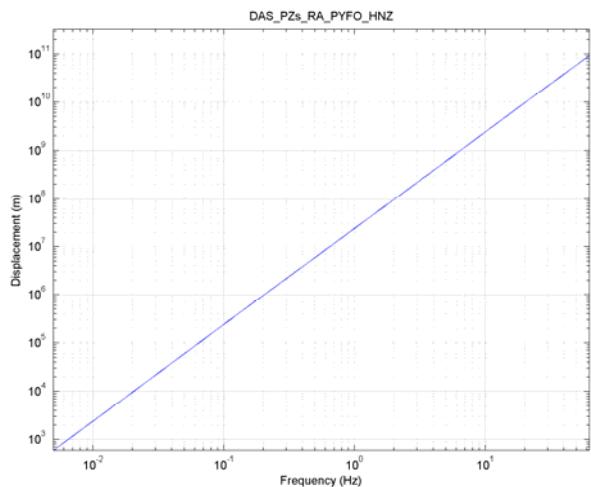
Municipality: Foix

Elevation: 380 m

Owner: BRGM

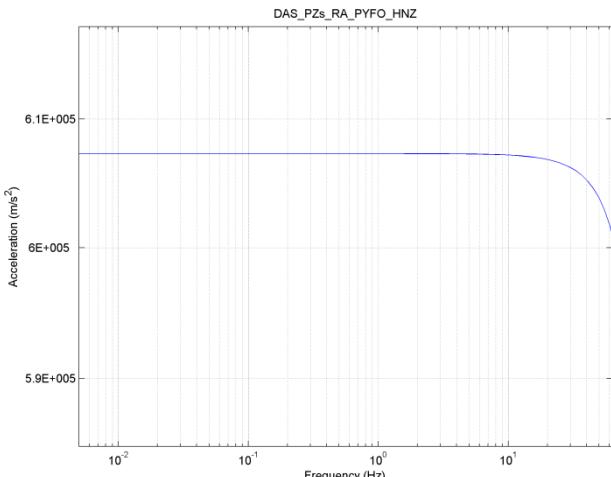
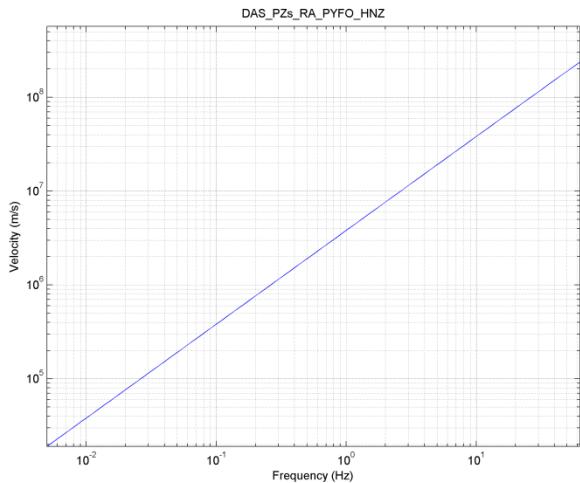
**Channel response**

Sensitivity	6.073000E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



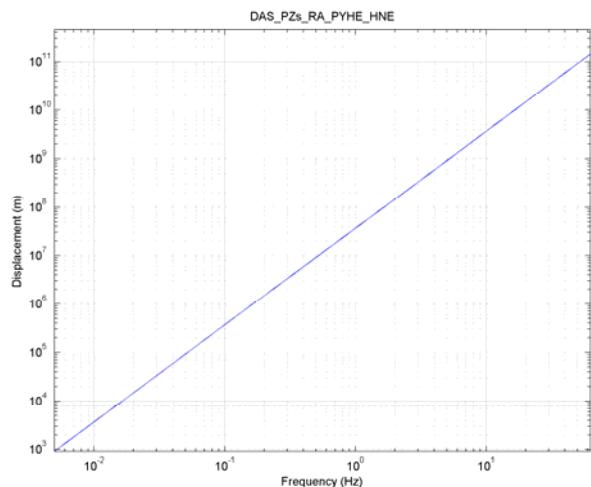
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.493717E+10

Amplitudes in nm and poles and zeros in rad/s



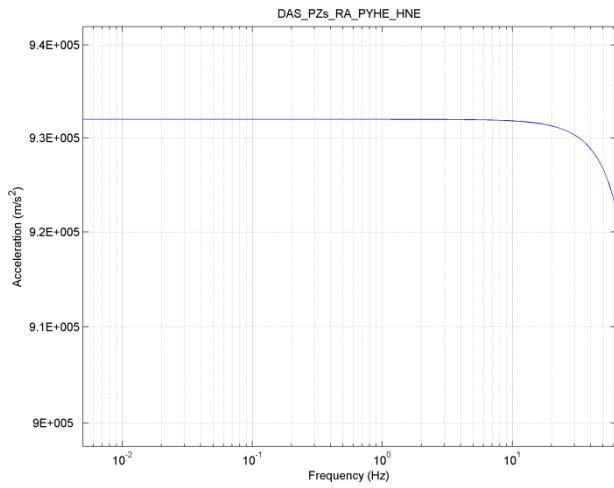
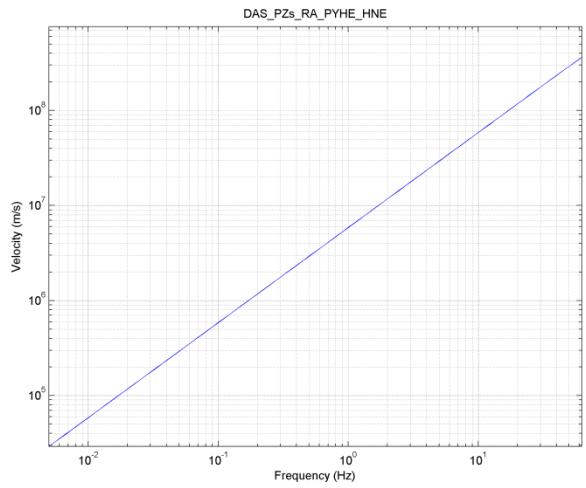
**NSCL code:****RA.PYHE.HNE.00****Coordinates (ERTS89)**Latitude: **43.3770N**Country: **France**Longitude: **1.7490E**Municipality: **Hendaye**Elevation: **60 m**Owner: **OMP****Channel response**

Sensitivity	<b>9.319930E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>125</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 2.292342E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYHE.HNN.00****Coordinates (ERTS89)**

Latitude: 43.3770N

Country: France

Longitude: 1.7490E

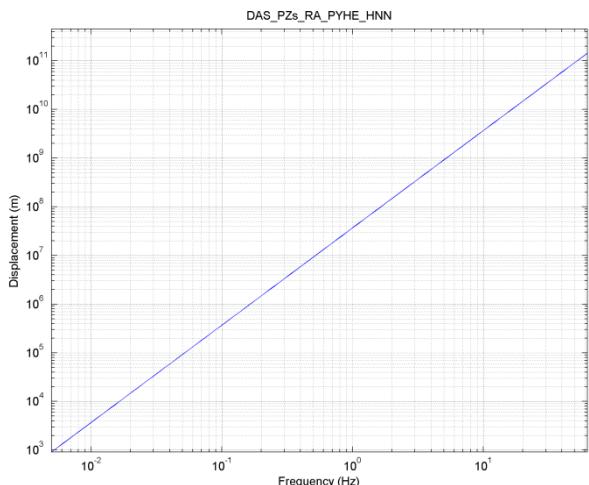
Municipality: Hendaye

Elevation: 60 m

Owner: OMP

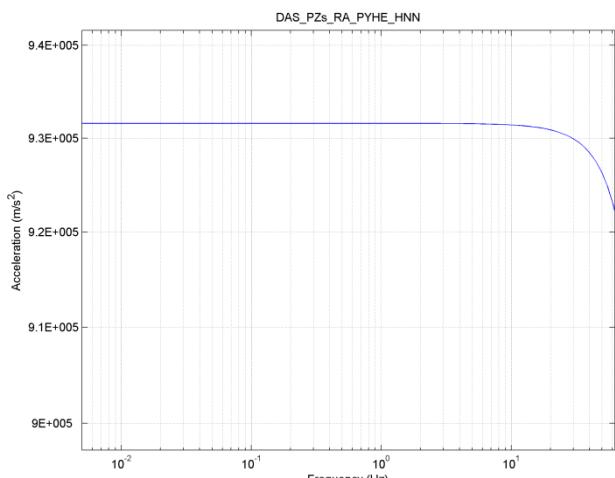
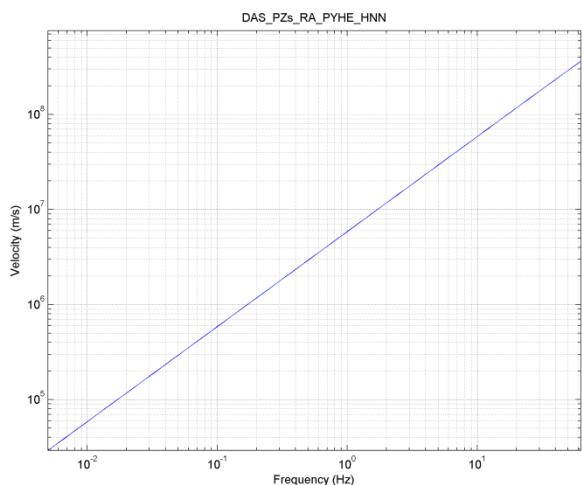
**Channel response**

Sensitivity	9.315830E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



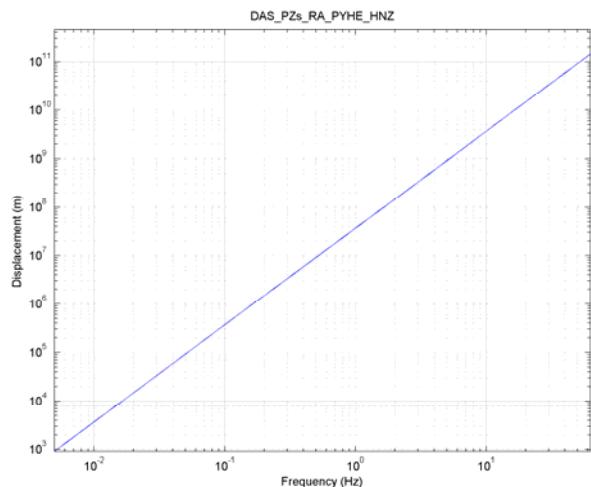
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 2.291333E+10

Amplitudes in nm and poles and zeros in rad/s



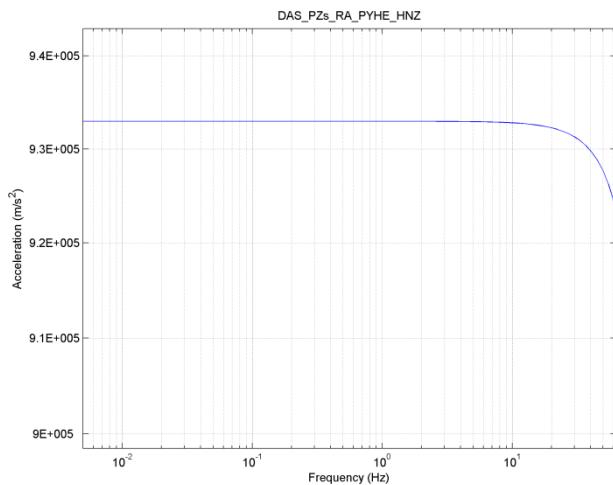
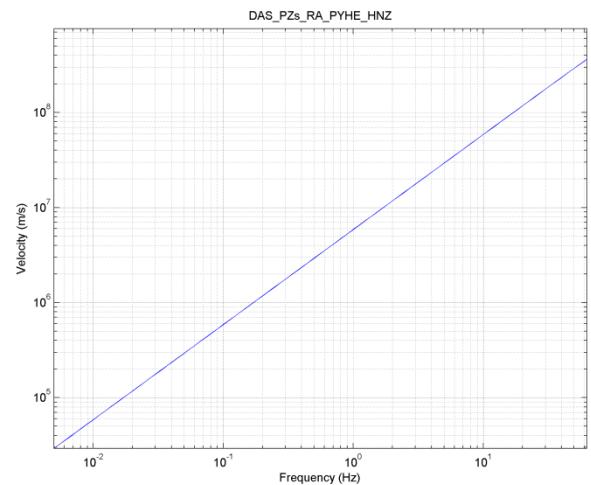
**NSCL code:****RA.PYHE.HNZ.00****Coordinates (ERTS89)**Latitude: **43.3770N**Country: **France**Longitude: **1.7490E**Municipality: **Hendaye**Elevation: **60 m**Owner: **OMP****Channel response**

Sensitivity	<b>9.329620E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>125</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 2.294726E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYLI.HNE.00****Coordinates (ERTS89)**

Latitude: 43.0020N

Country: France

Longitude: 1.1360E

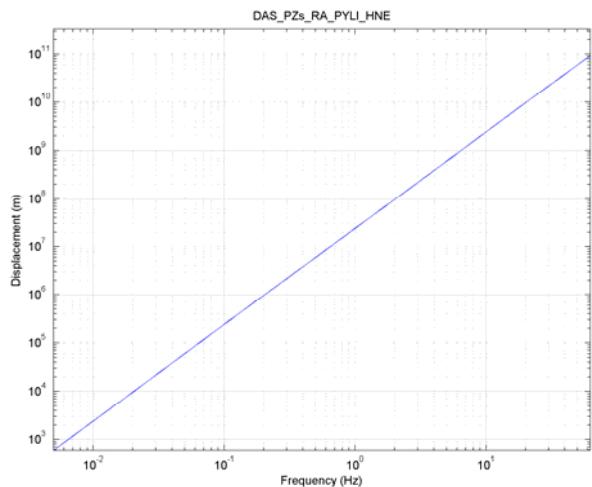
Municipality: Saint Lizier

Elevation: 424 m

Owner: BRGM

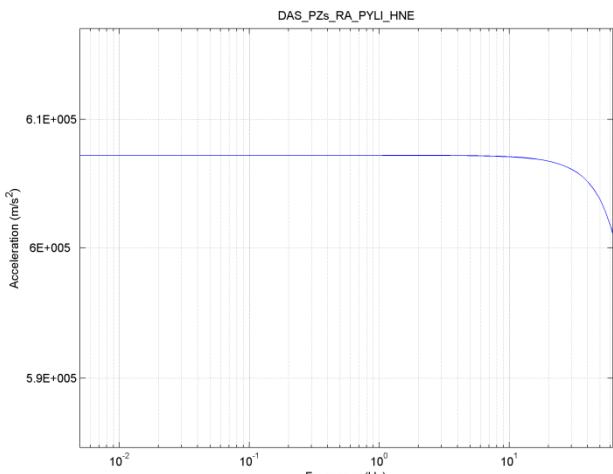
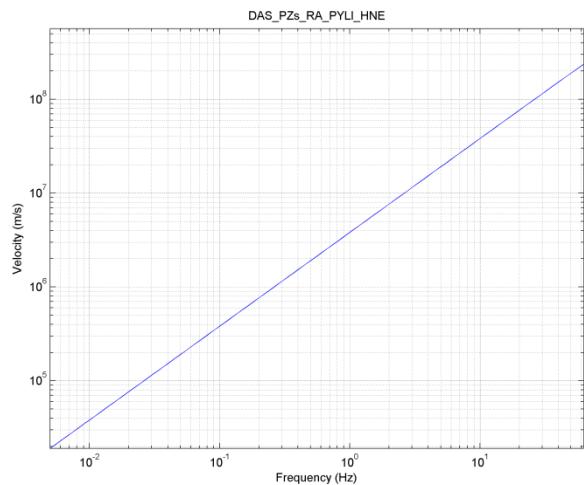
**Channel response**

Sensitivity	6.071790E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.493420E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYLI.HNN.00****Coordinates (ERTS89)**

Latitude: 43.0020N

Country: France

Longitude: 1.1360E

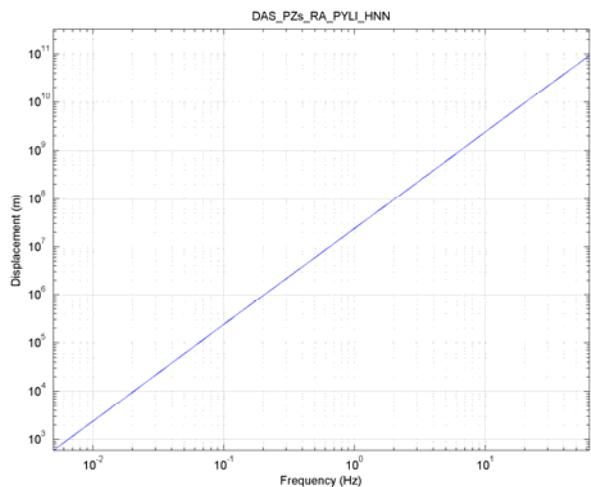
Municipality: Saint Lizier

Elevation: 424 m

Owner: BRGM

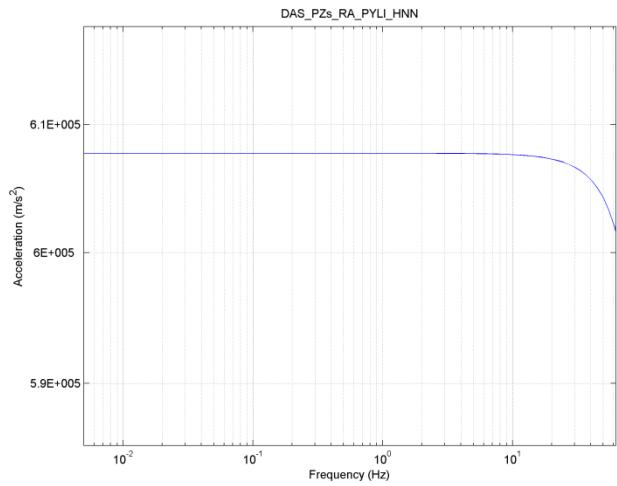
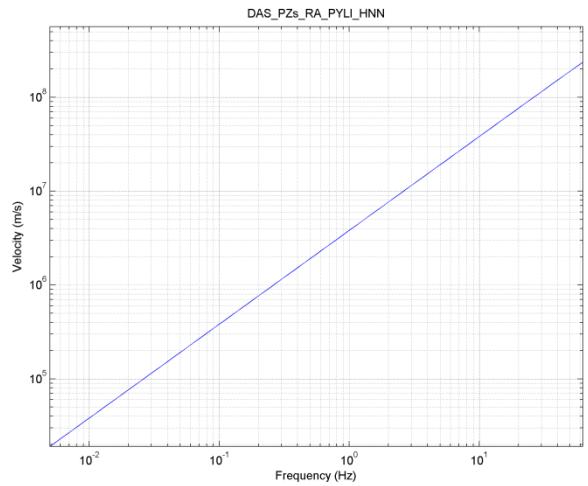
**Channel response**

Sensitivity	6.077380E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.494795E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYLI.HNZ.00****Coordinates (ERTS89)**

Latitude: 43.0020N

Country: France

Longitude: 1.1360E

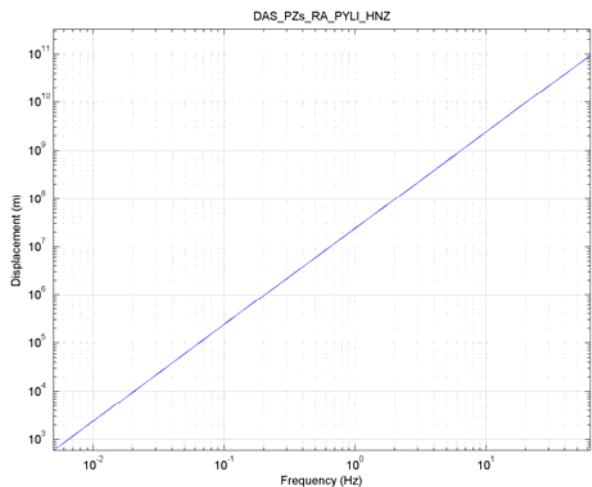
Municipality: Saint Lizier

Elevation: 424 m

Owner: BRGM

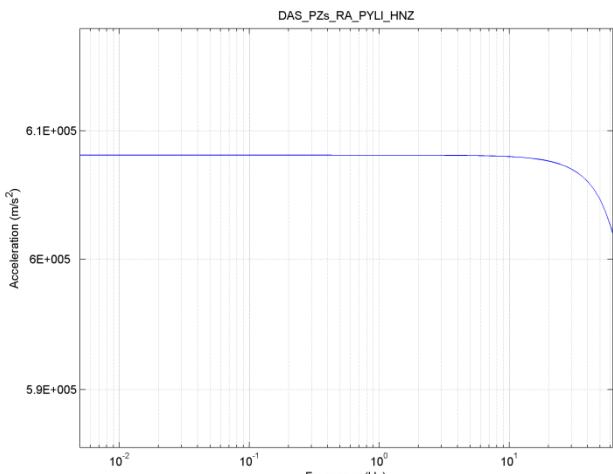
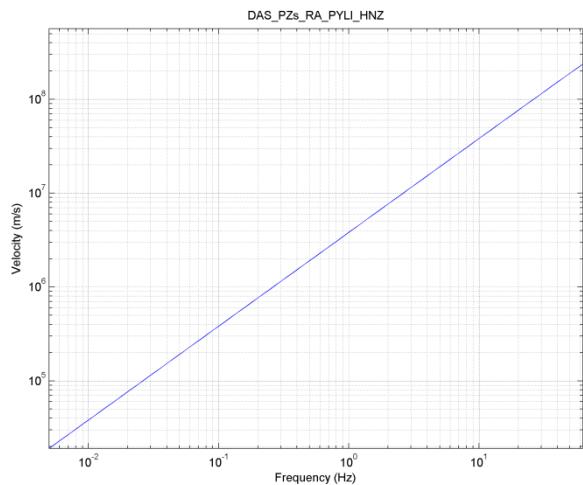
**Channel response**

Sensitivity	6.080790E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



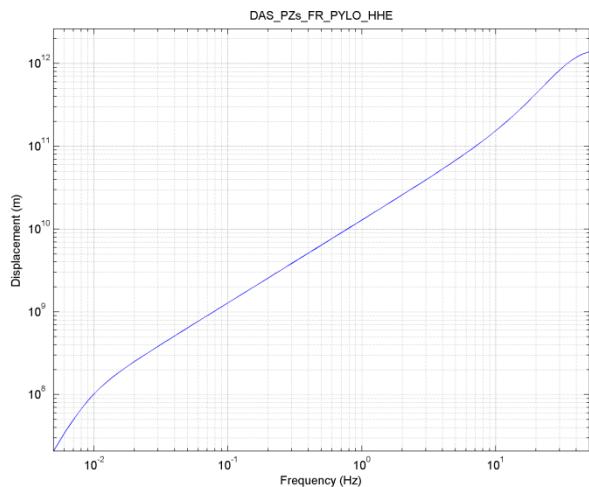
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.495634E+10

Amplitudes in nm and poles and zeros in rad/s



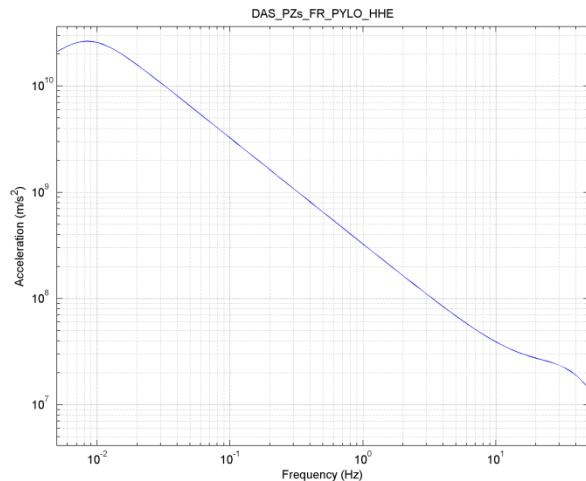
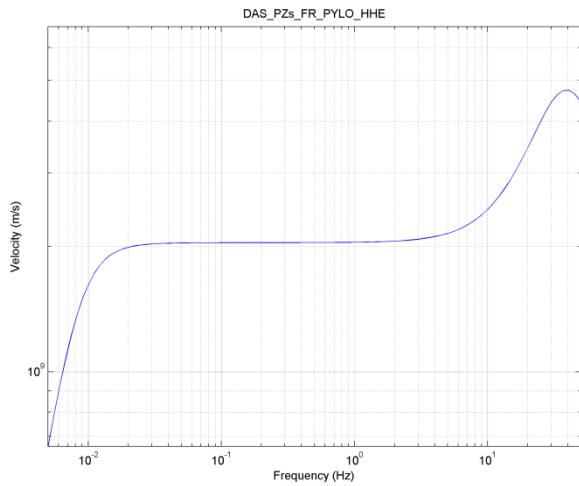
**NSCL code:****FR.PYLO.HHE.00****Coordinates (ERTS89)**Latitude: **43.0982N**Country: **France**Longitude: **0.0478W**Municipality: **Lourdes**Elevation: **410 m**Owner: **OMP****Channel response**

Sensitivity	<b>2.236960E+09</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 5  
 0.0000 0.0000  
 0.0000 0.0000  
 0.0000 0.0000  
 -105.9973 0.0000  
 -158.0033 0.0000  
 POLES 7  
 -0.0386 0.0365  
 -0.0386 -0.0365  
 -158.0033 193.0006  
 -158.0033 -193.0006  
 -638.9999 1417.9890  
 -638.9999 -1417.9890  
 -189.9972 0.0000  
 CONSTANT 3.486026E+9

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.PYLO.HHN.00****Coordinates (ERTS89)**

Latitude: 43.0982N

Country: France

Longitude: 0.0478W

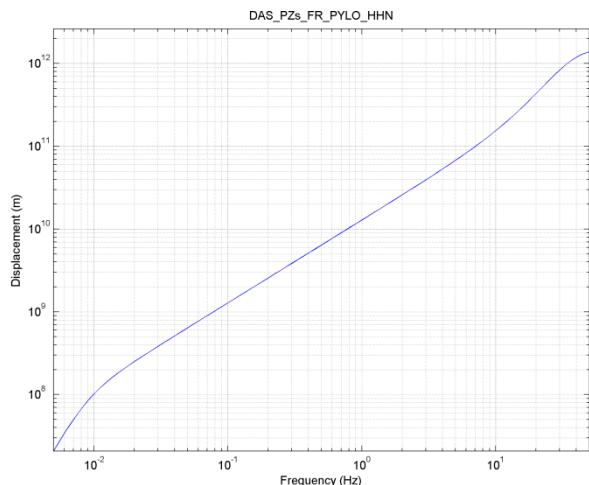
Municipality: Lourdes

Elevation: 410 m

Owner: OMP

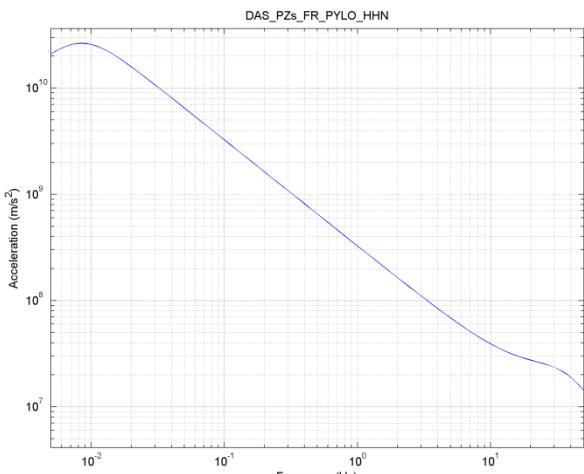
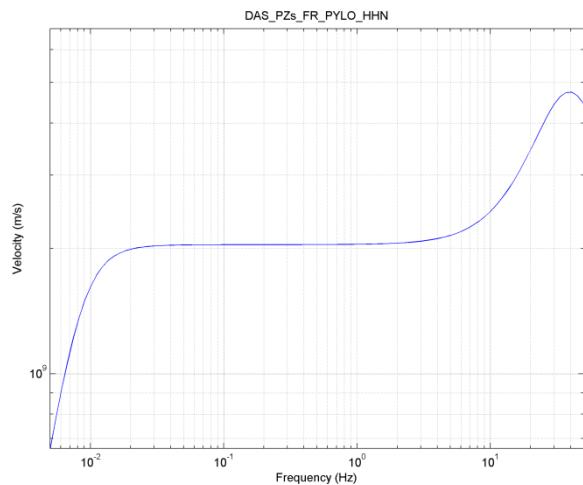
**Channel response**

Sensitivity	2.236960E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



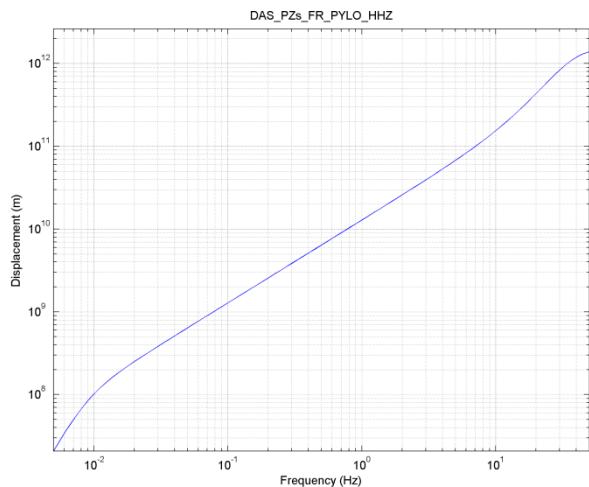
ZEROS 5  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-105.9973 0.0000  
-158.0033 0.0000  
POLES 7  
-0.0386 0.0365  
-0.0386 -0.0365  
-158.0033 193.0006  
-158.0033 -193.0006  
-638.9999 1417.9890  
-638.9999 -1417.9890  
-189.9972 0.0000  
CONSTANT 3.486026E+9

Amplitudes in nm and poles and zeros in rad/s



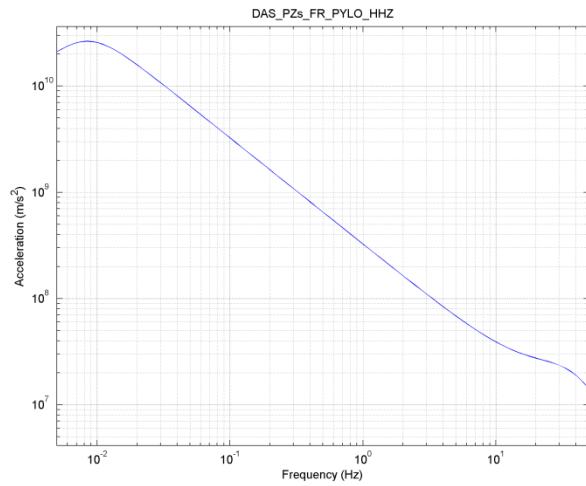
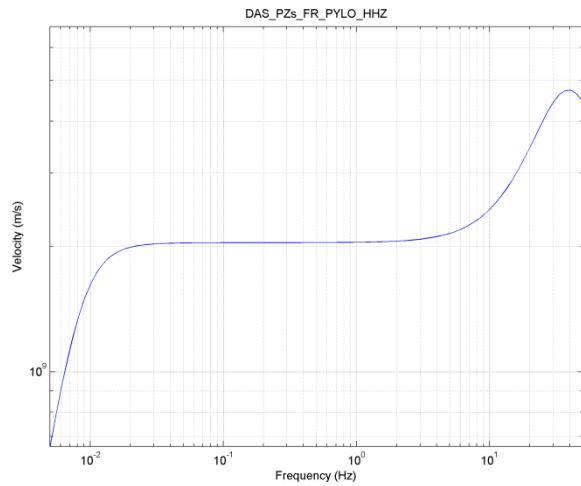
**NSCL code:****FR.PYLO.HHZ.00****Coordinates (ERTS89)**Latitude: **43.0982N**Country: **France**Longitude: **0.0478W**Municipality: **Lourdes**Elevation: **410 m**Owner: **OMP****Channel response**

Sensitivity	<b>2.236960E+09</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 5  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-105.9973 0.0000  
-158.0033 0.0000  
POLES 7  
-0.0386 0.0365  
-0.0386 -0.0365  
-158.0033 193.0006  
-158.0033 -193.0006  
-638.9999 1417.9890  
-638.9999 -1417.9890  
-189.9972 0.0000  
CONSTANT 3.486026E+9

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYLS.HNE.00****Coordinates (ERTS89)**

Latitude: 42.8600N

Country: France

Longitude: 0.0090W

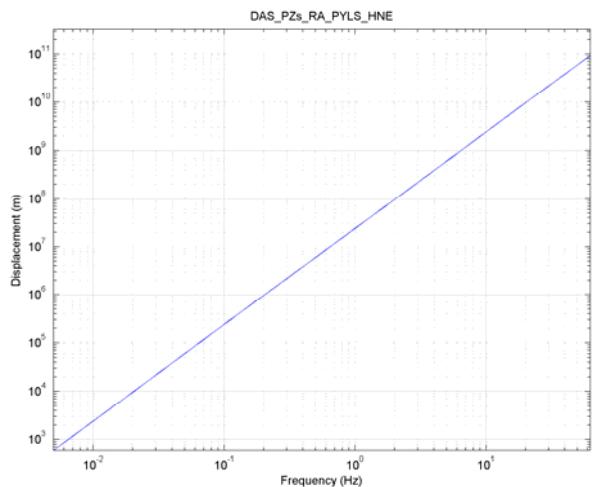
Municipality: Luz-Saint-Sauveur

Elevation: 770 m

Owner: BRGM

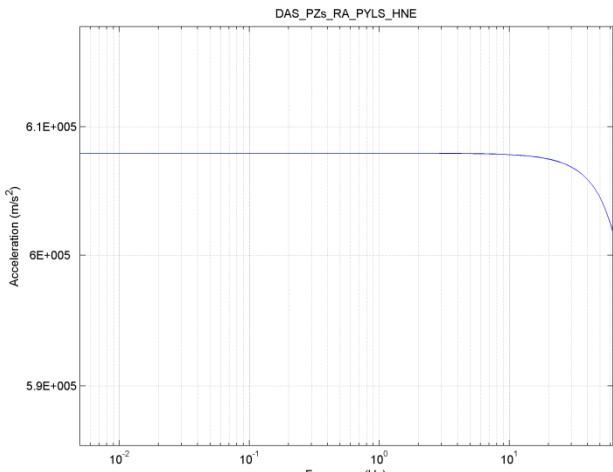
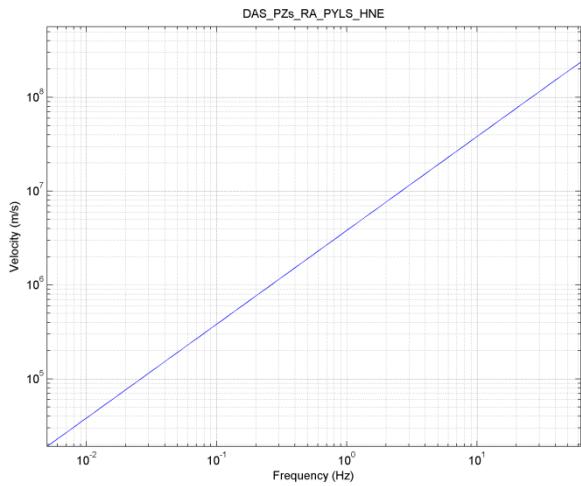
**Channel response**

Sensitivity	6.079320E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



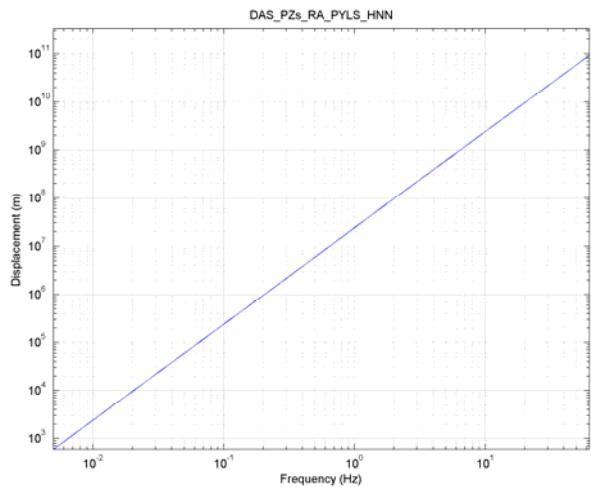
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.495272E+10

Amplitudes in nm and poles and zeros in rad/s



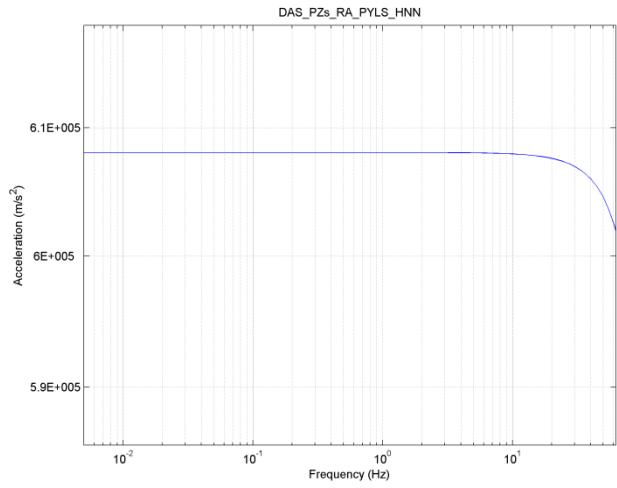
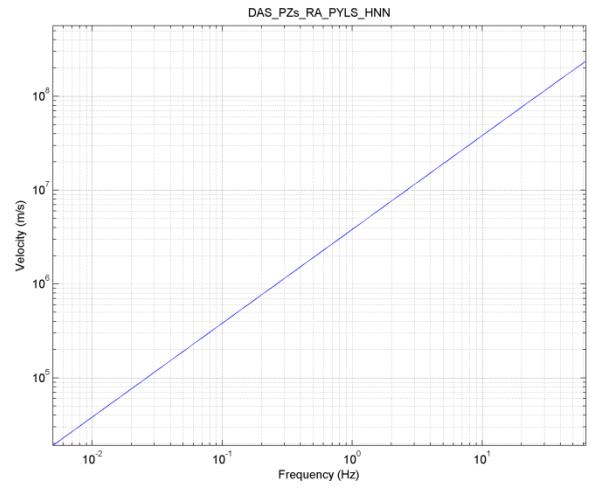
**NSCL code:****RA.PYLS.HNN.00****Coordinates (ERTS89)**Latitude: **42.8600N**Country: **France**Longitude: **0.0090W**Municipality: **Luz-Saint-Sauveur**Elevation: **770 m**Owner: **BRGM****Channel response**

Sensitivity	<b>6.080540E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>125</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.495572E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYLS.HNZ.00****Coordinates (ERTS89)**

Latitude: 42.8600N

Country: France

Longitude: 0.0090W

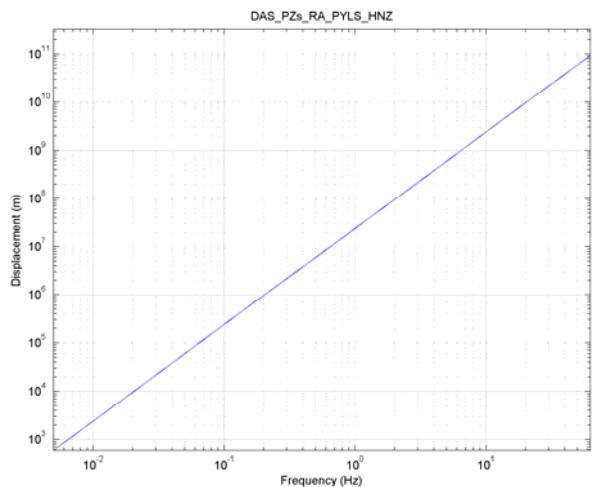
Municipality: Luz-Saint-Sauveur

Elevation: 770 m

Owner: BRGM

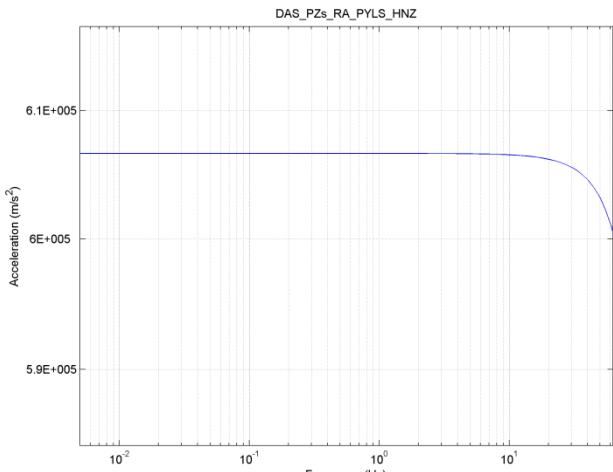
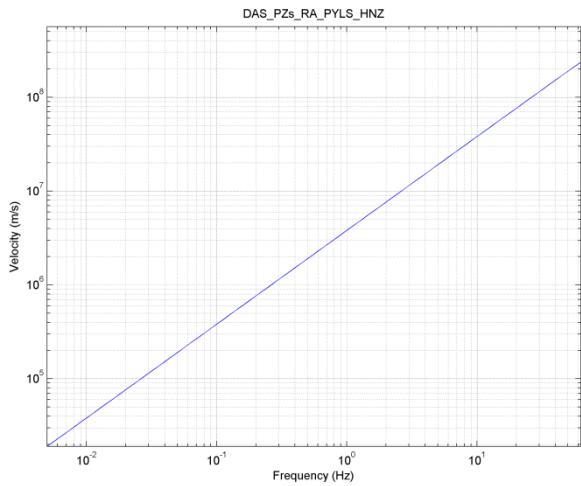
**Channel response**

Sensitivity	6.066450E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



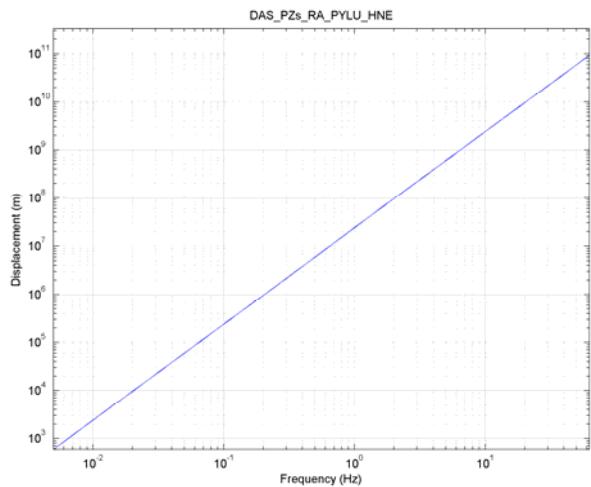
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.492106E+10

Amplitudes in nm and poles and zeros in rad/s



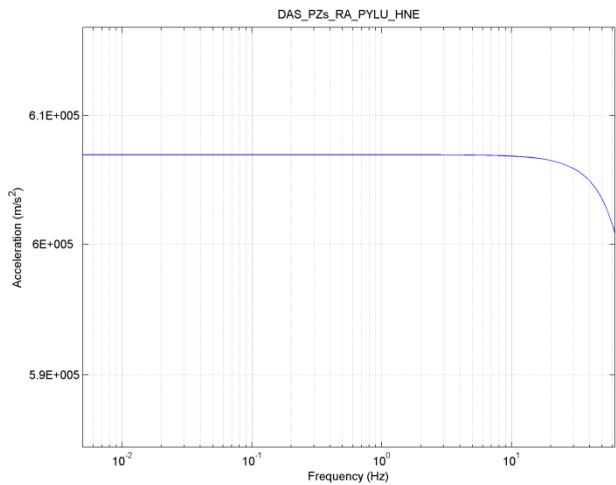
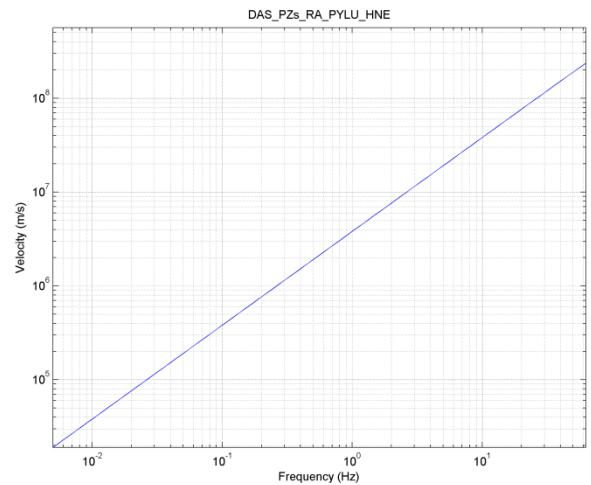
**NSCL code:****RA.PYLU.HNE.00****Coordinates (ERTS89)**Latitude: **42.7906N**Country: **France**Longitude: **0.6014E**Municipality: **Luchon**Elevation: **630 m**Owner: **OMP****Channel response**

Sensitivity	<b>6.069350E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>125</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.492820E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYLU.HNN.00****Coordinates (ERTS89)**

Latitude: 42.7906N

Country: France

Longitude: 0.6014E

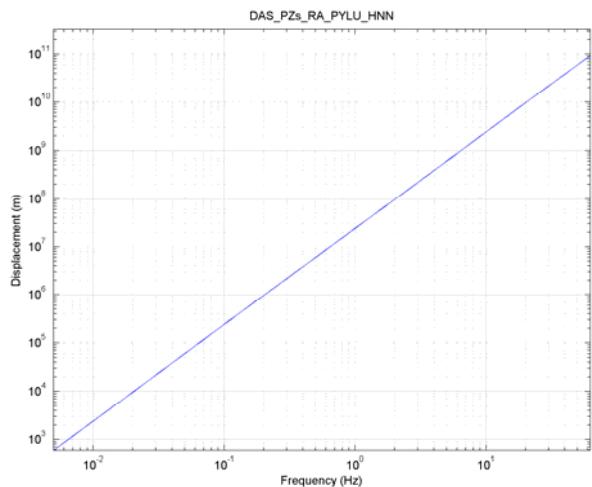
Municipality: Luchon

Elevation: 630 m

Owner: OMP

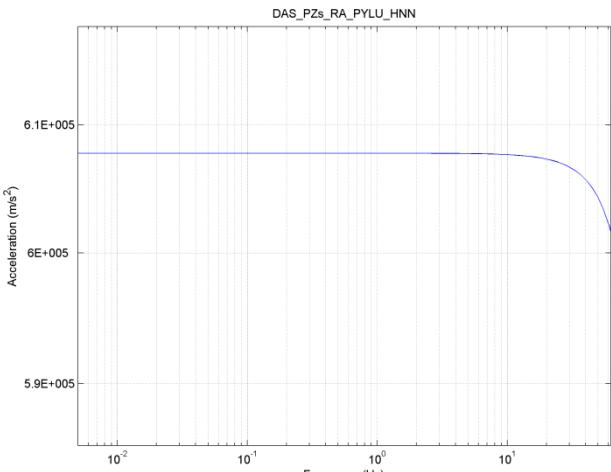
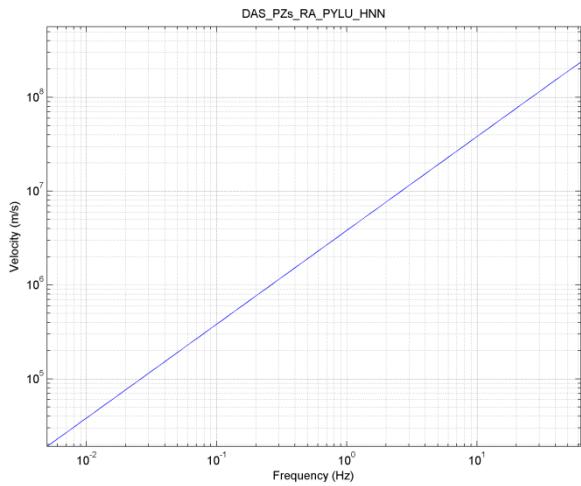
**Channel response**

Sensitivity	6.077610E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.494851E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYLU.HNZ.00****Coordinates (ERTS89)**

Latitude: 42.7906N

Country: France

Longitude: 0.6014E

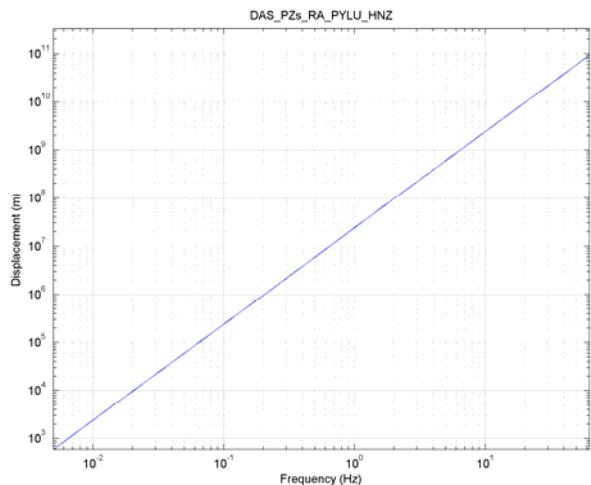
Municipality: Luchon

Elevation: 630 m

Owner: OMP

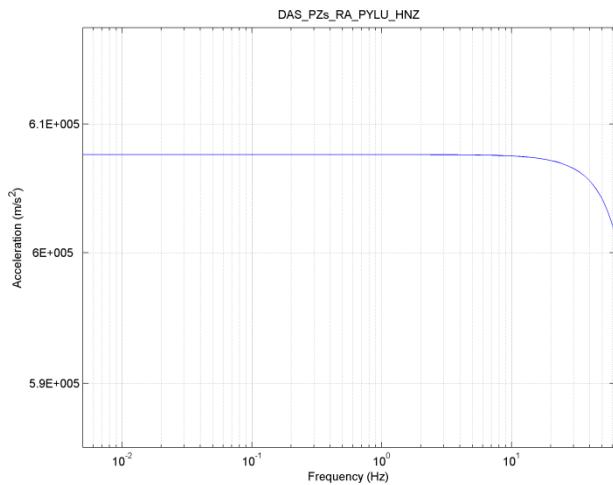
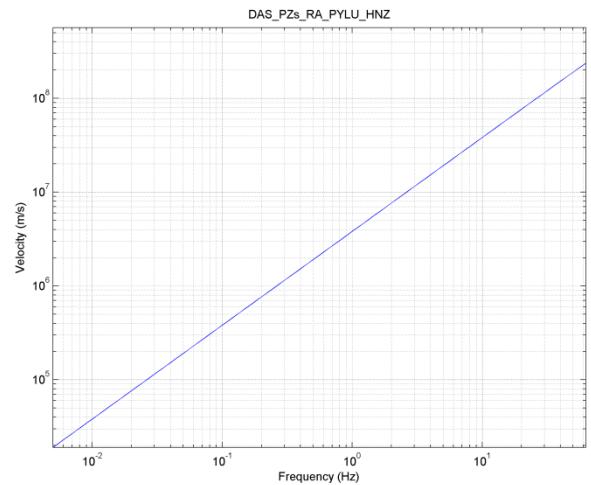
**Channel response**

Sensitivity	6.076160E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.494495E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYPD.HNE.00****Coordinates (ERTS89)**

Latitude: 42.6142N

Country: France

Longitude: 2.4156E

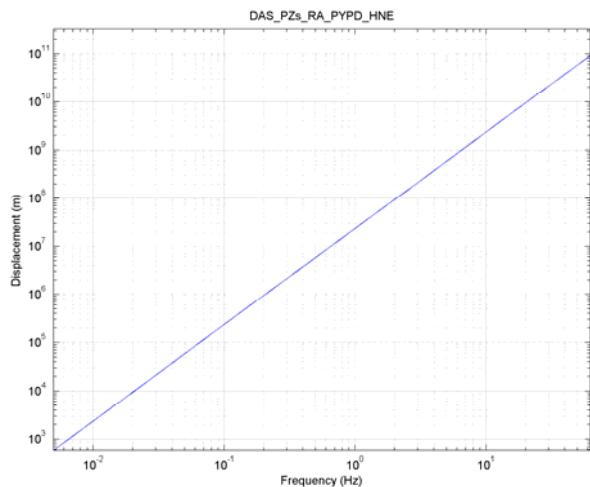
Municipality: Prades

Elevation: 350 m

Owner: OMP

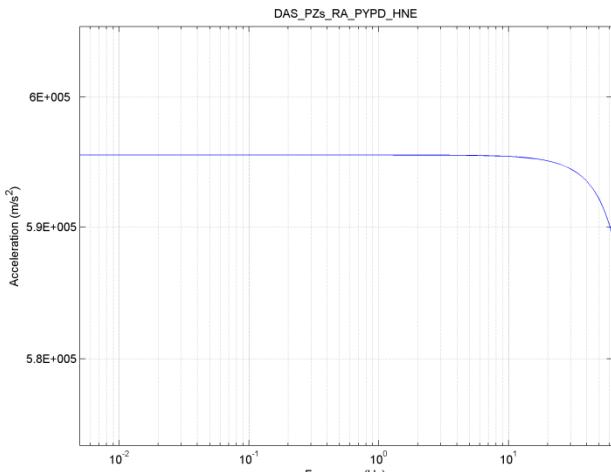
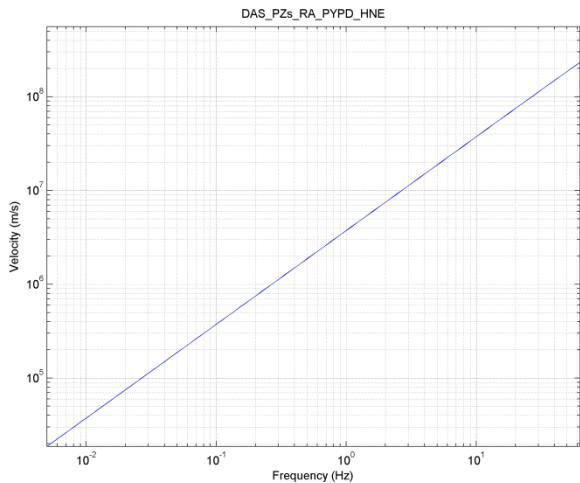
**Channel response**

Sensitivity	5.955230E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



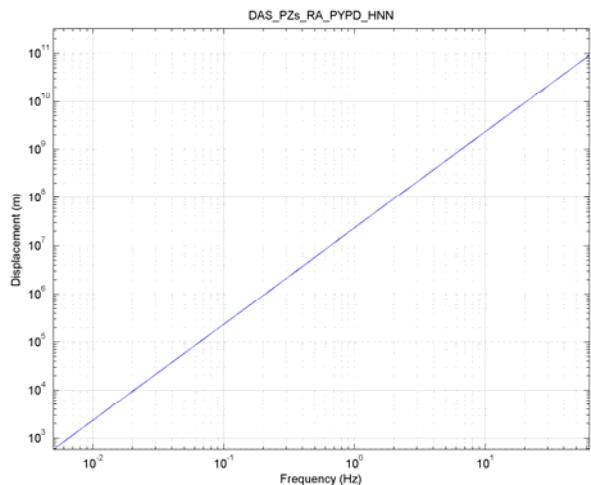
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.464751E+10

Amplitudes in nm and poles and zeros in rad/s



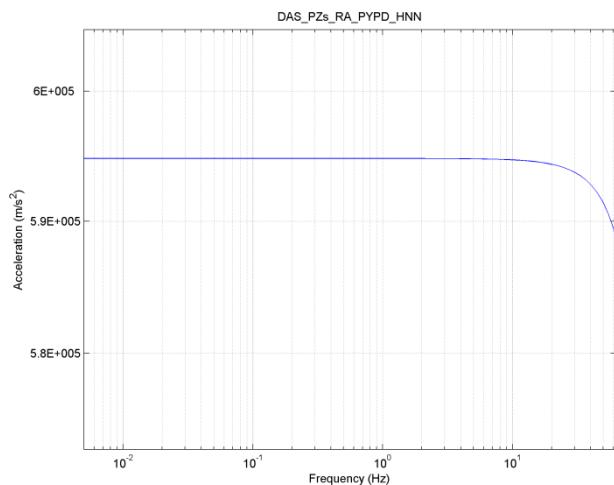
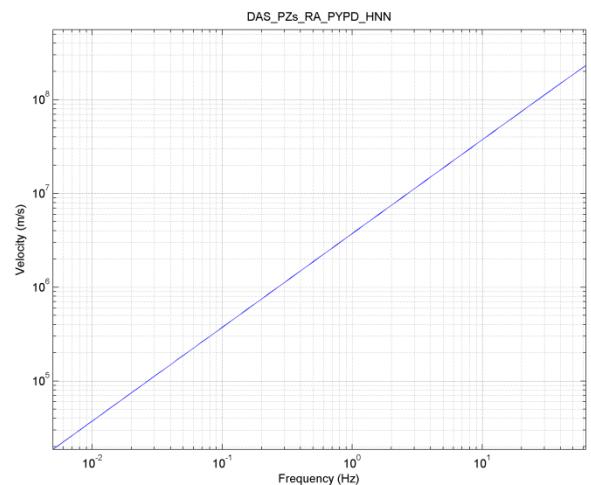
**NSCL code:****RA.PYPD.HNN.00****Coordinates (ERTS89)**Latitude: **42.6142N**Country: **France**Longitude: **2.4156E**Municipality: **Prades**Elevation: **350 m**Owner: **OMP****Channel response**

Sensitivity	<b>5.948080E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>125</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.462992E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYPD.HNZ.00****Coordinates (ERTS89)**

Latitude: 42.6142N

Country: France

Longitude: 2.4156E

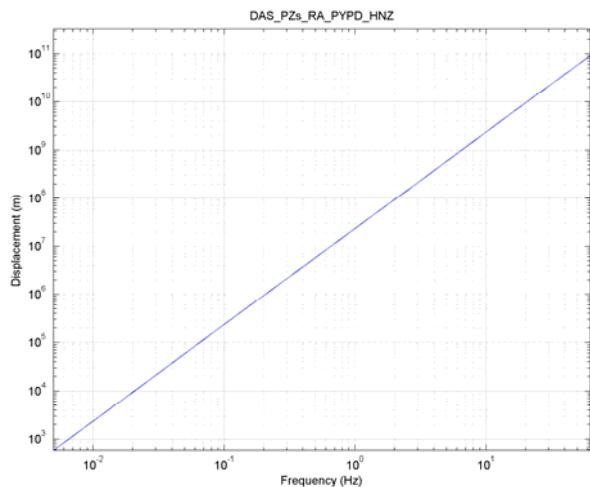
Municipality: Prades

Elevation: 350 m

Owner: OMP

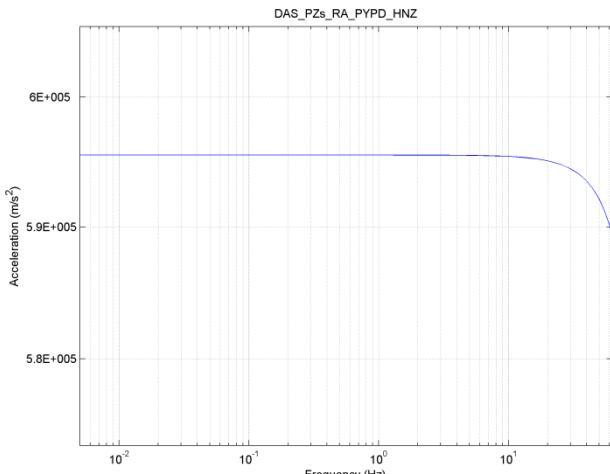
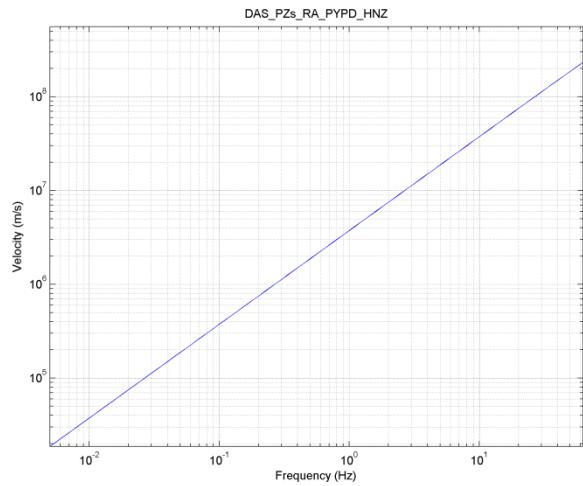
**Channel response**

Sensitivity	5.955230E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



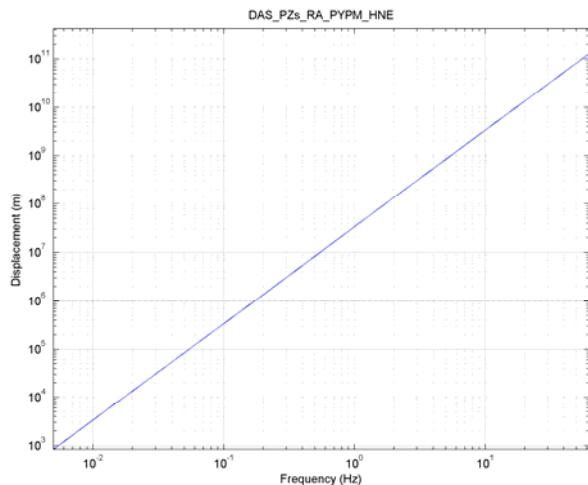
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.464751E+10

Amplitudes in nm and poles and zeros in rad/s



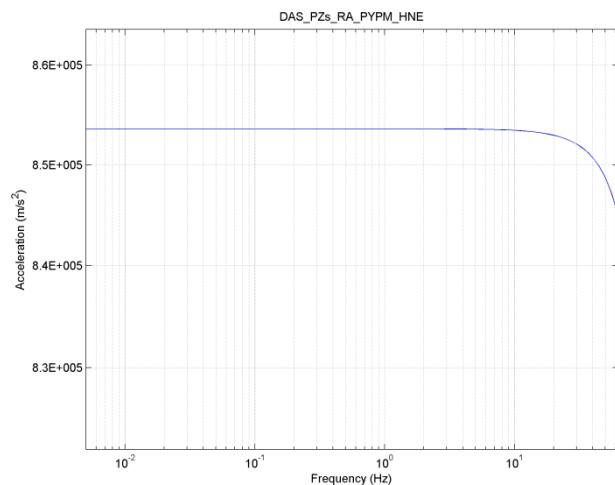
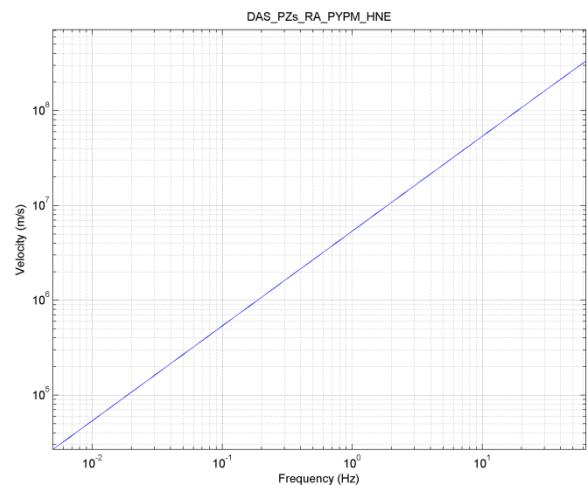
**NSCL code:****RA.PYPM.HNE.00****Coordinates (ERTS89)**Latitude: **42.4160N**Country: **France**Longitude: **2.4390E**Municipality: **Prats de Mollo**Elevation: **920 m**Owner: **BRGM****Channel response**

Sensitivity	<b>8.536030E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>125</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 2.099525E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYPM.HNN.00****Coordinates (ERTS89)**

Latitude: 42.4160N

Country: France

Longitude: 2.4390E

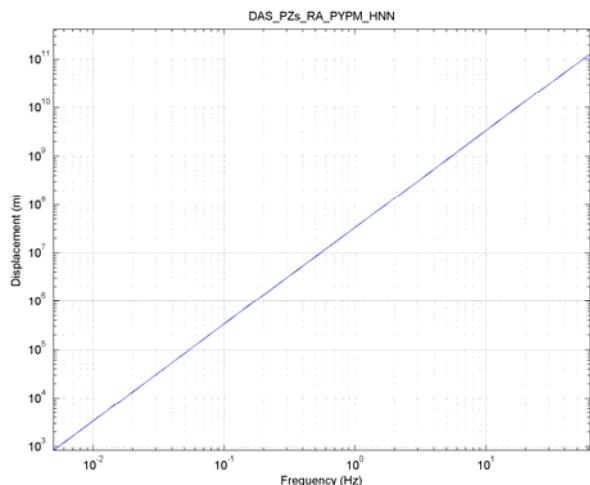
Municipality: Prats de Mollo

Elevation: 920 m

Owner: BRGM

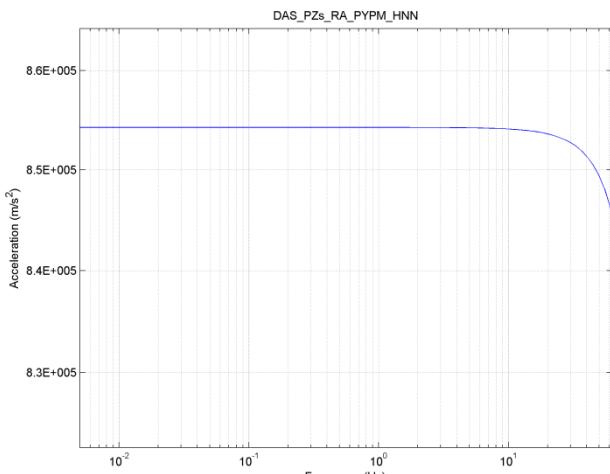
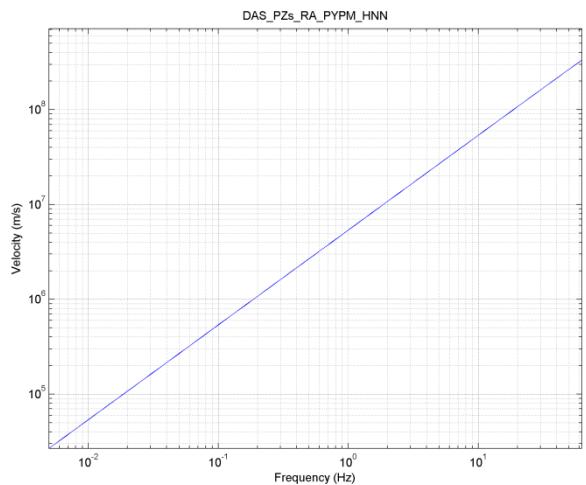
**Channel response**

Sensitivity	8.542520E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



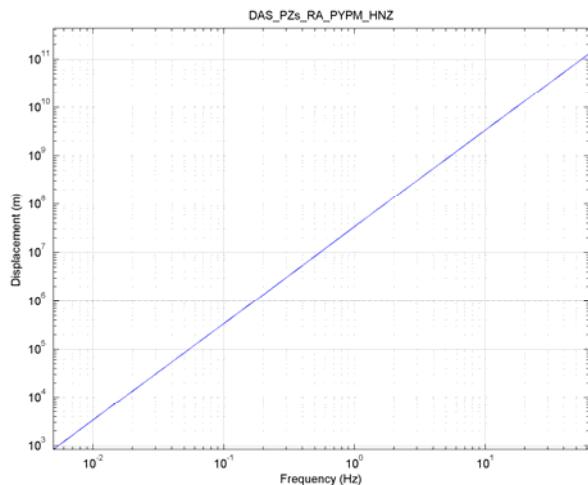
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 2.101122E+10

Amplitudes in nm and poles and zeros in rad/s



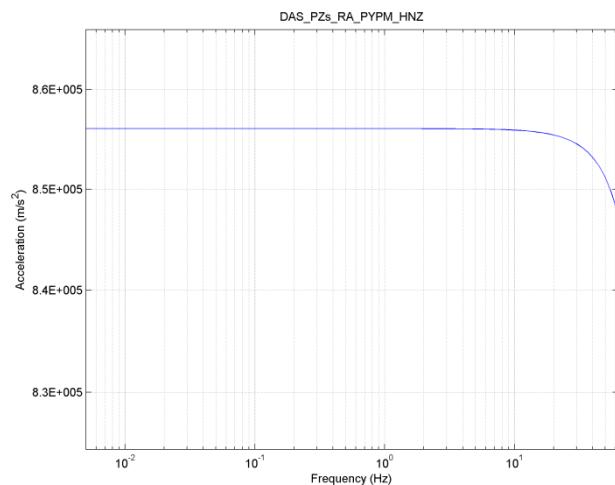
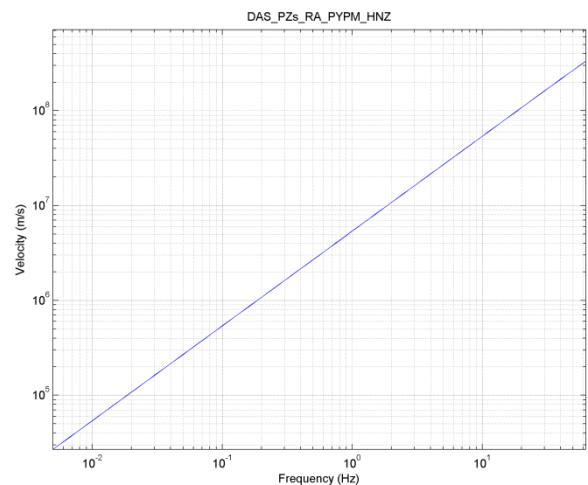
**NSCL code:****RA.PYPM.HNZ.00****Coordinates (ERTS89)**Latitude: **42.4160N**Country: **France**Longitude: **2.4390E**Municipality: **Prats de Mollo**Elevation: **920 m**Owner: **BRGM****Channel response**

Sensitivity	<b>8.560660E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>125</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 2.105583E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYPP.HNE.00****Coordinates (ERTS89)**

Latitude: 43.1632N

Country: France

Longitude: 1.2325W

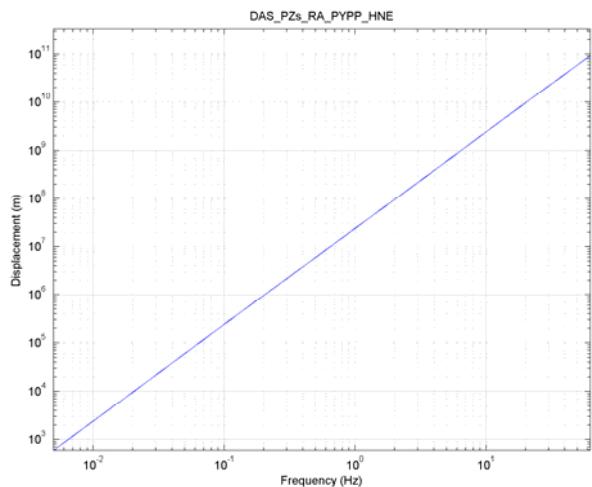
Municipality: St-Jean-Pied de Port

Elevation: 230 m

Owner: OMP

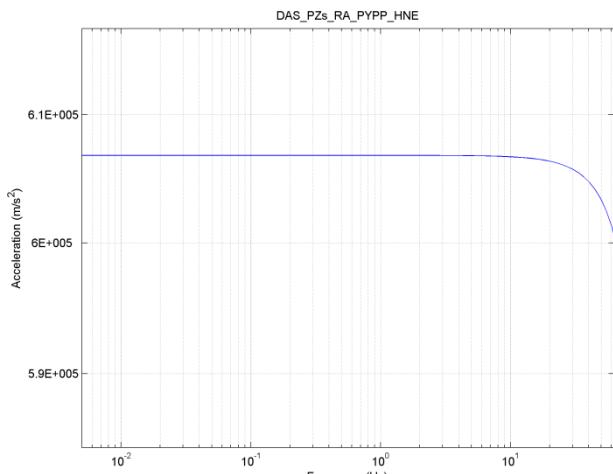
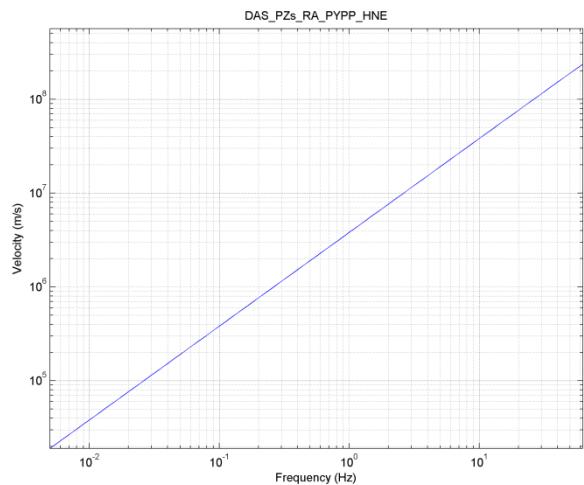
**Channel response**

Sensitivity	6.068140E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



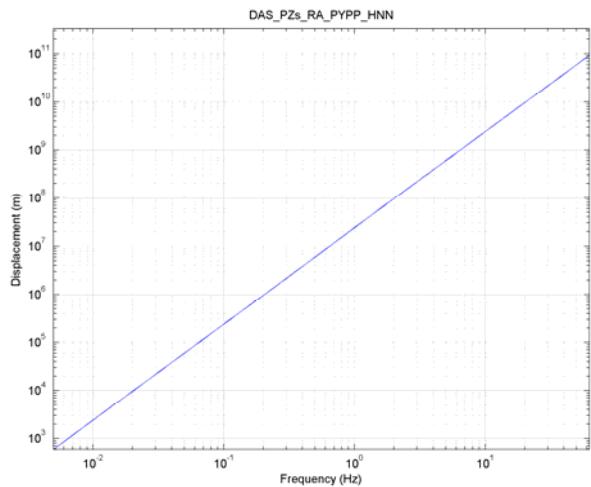
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.492522E+10

Amplitudes in nm and poles and zeros in rad/s



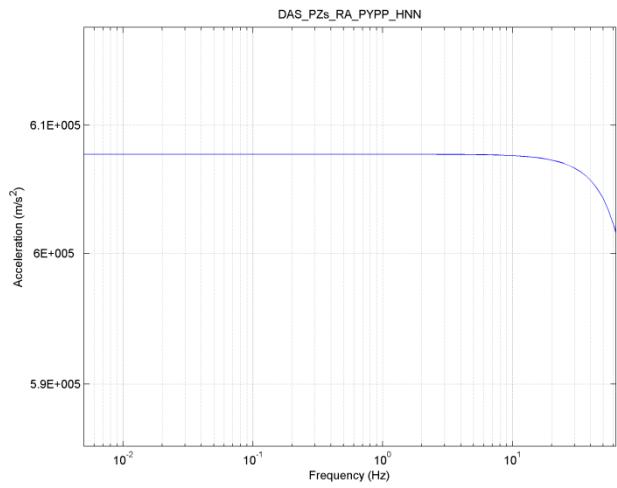
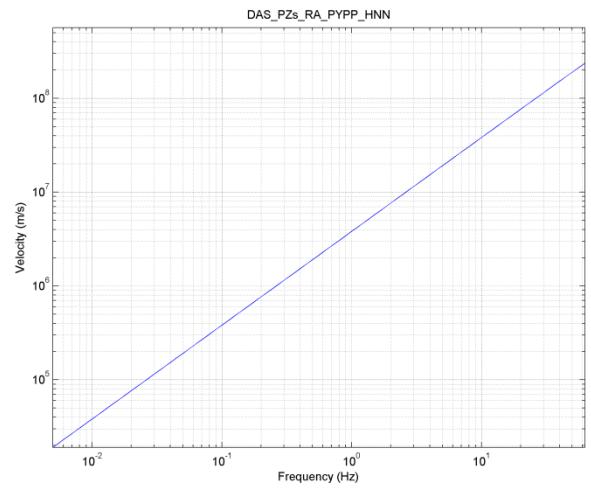
**NSCL code:****RA.PYPP.HNN.00****Coordinates (ERTS89)**Latitude: **43.1632N**Country: **France**Longitude: **1.2325W**Municipality: **St-Jean-Pied de Port**Elevation: **230 m**Owner: **OMP****Channel response**

Sensitivity	<b>6.077140E+05</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s<sup>2</sup></b>
Sample rate (sps)	<b>125</b>



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.494736E+10

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****RA.PYPP.HNZ.00****Coordinates (ERTS89)**

Latitude: 43.1632N

Country: France

Longitude: 1.2325W

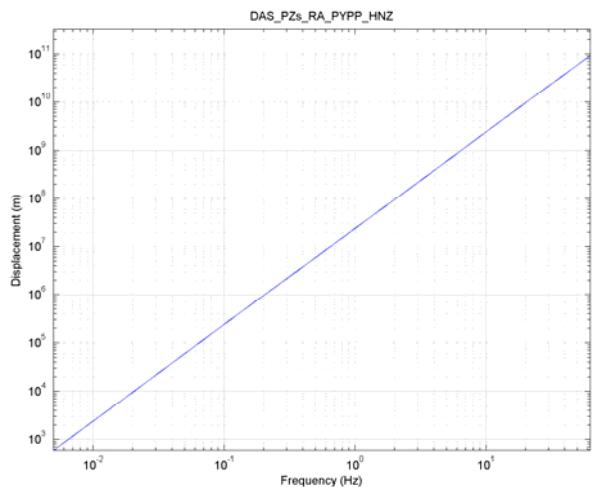
Municipality: St-Jean-Pied de Port

Elevation: 230 m

Owner: OMP

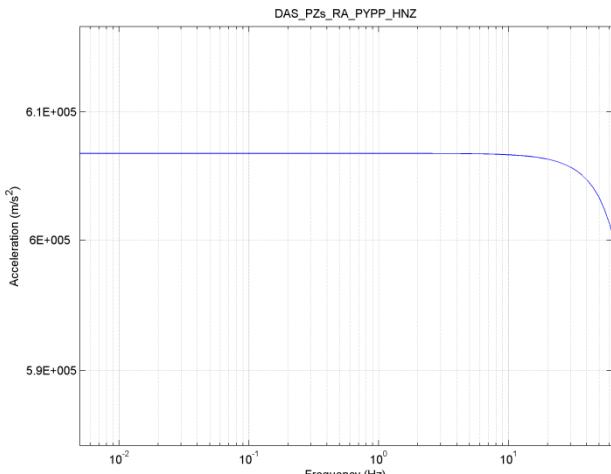
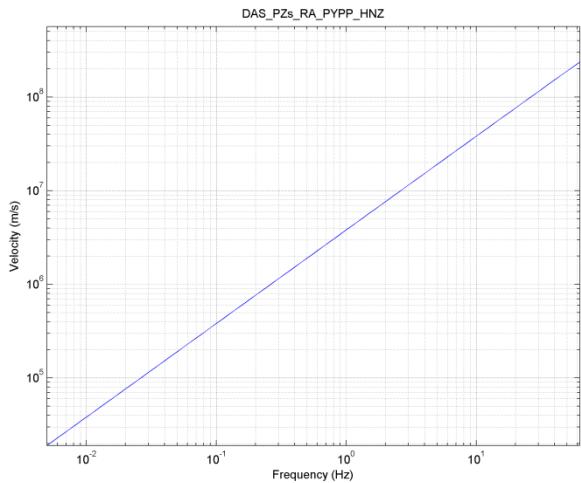
**Channel response**

Sensitivity	6.067410E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	125



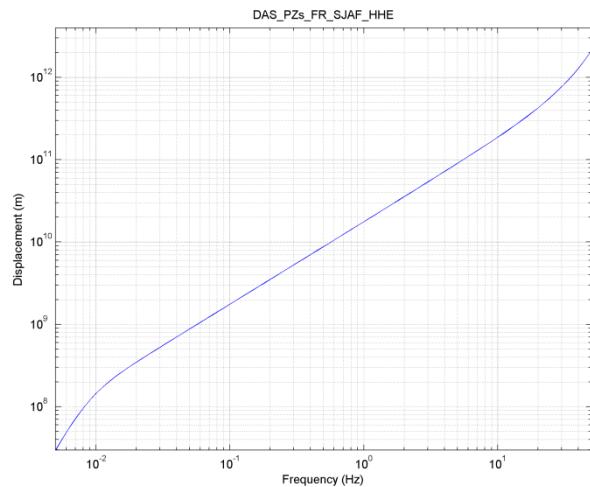
ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-981.0000 1009.0167  
-981.0000 -1009.0167  
-3290.0015 1262.9831  
-3290.0015 -1262.9831  
CONSTANT 1.492343E+10

Amplitudes in nm and poles and zeros in rad/s



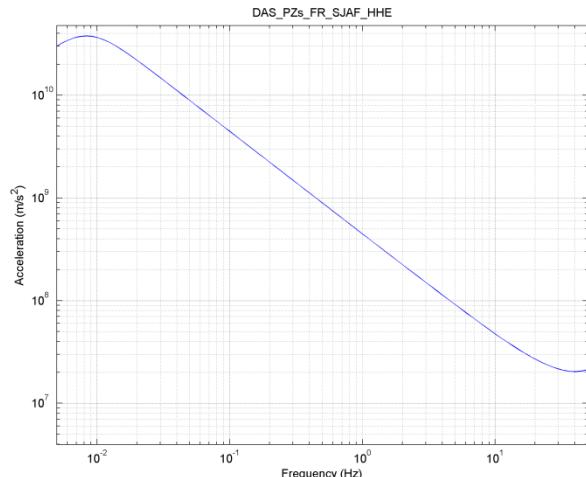
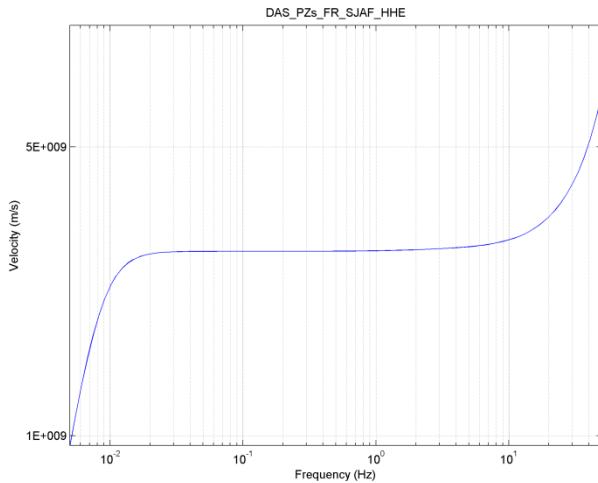
**NSCL code:****FR.SJAF.HHE.00****Coordinates (ERTS89)**Latitude: **42.4845N**Country: **France**Longitude: **2.8822E**Municipality: **St-Jean-Pied d'A**Elevation: **450 m**Owner: **OMP****Channel response**

Sensitivity	<b>2.796200E+09</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 7  
 0.0000 0.0000  
 0.0000 0.0000  
 0.0000 0.0000  
 -15.1487 0.0000  
 -196.6635 0.0000  
 -461.8137 429.0784  
 -461.8137 -429.0784  
 POLES 11  
 -0.0370 0.0370  
 -0.0370 -0.0370  
 -15.3938 0.0000  
 -94.7504 386.4156  
 -94.7504 -386.4156  
 -376.9908 0.0000  
 -454.5252 0.0000  
 -9512.7345 11469.9451  
 -9512.7345 -11469.9451  
 -10239.6984 2725.0152  
 -10239.6984 -2725.0152  
 CONSTANT 2.459641E+19

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.SJAF.HHN.00****Coordinates (ERTS89)**

Latitude: 42.4845N

Country: France

Longitude: 2.8822E

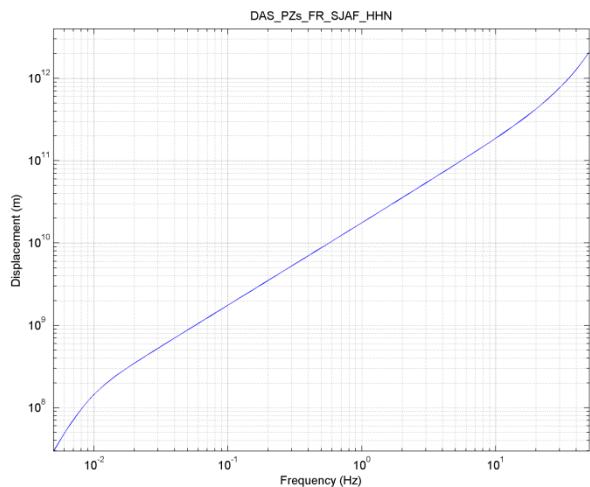
Municipality: St-Jean-Pied d'A

Elevation: 450 m

Owner: OMP

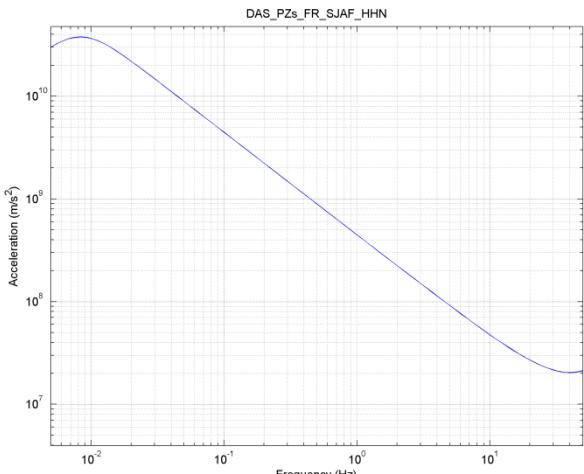
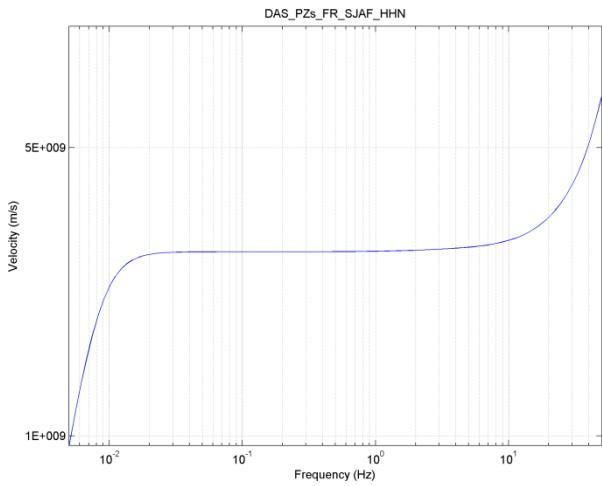
**Channel response**

Sensitivity	2.796200E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



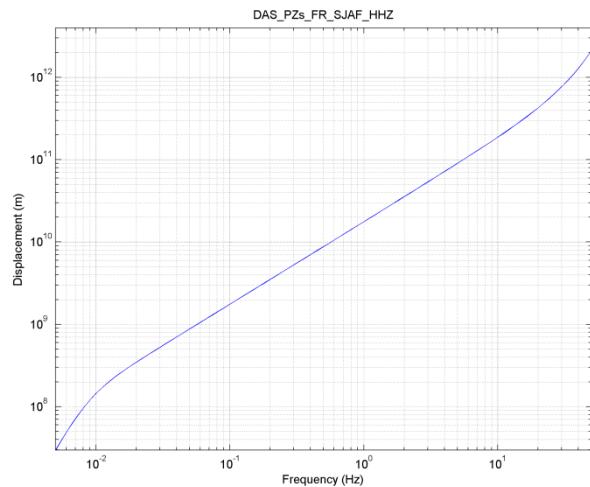
ZEROS 7  
 0.0000 0.0000  
 0.0000 0.0000  
 0.0000 0.0000  
 -15.1487 0.0000  
 -196.6635 0.0000  
 -461.8137 429.0784  
 -461.8137 -429.0784  
 POLES 11  
 -0.0370 0.0370  
 -0.0370 -0.0370  
 -15.3938 0.0000  
 -94.7504 386.4156  
 -94.7504 -386.4156  
 -376.9908 0.0000  
 -454.5252 0.0000  
 -9512.7345 11469.9451  
 -9512.7345 -11469.9451  
 -10239.6984 2725.0152  
 -10239.6984 -2725.0152  
 CONSTANT 2.459641E+19

Amplitudes in nm and poles and zeros in rad/s



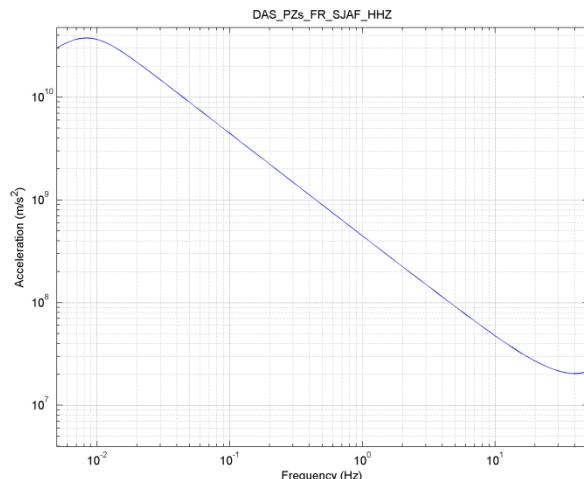
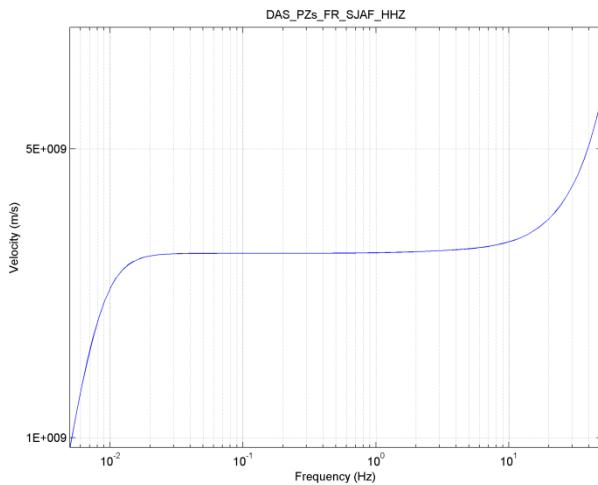
**NSCL code:****FR.SJAF.HHZ.00****Coordinates (ERTS89)**Latitude: **42.4845N**Country: **France**Longitude: **2.8822E**Municipality: **St-Jean-Pied d'A**Elevation: **450 m**Owner: **OMP****Channel response**

Sensitivity	<b>2.796200E+09</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 7  
 0.0000 0.0000  
 0.0000 0.0000  
 0.0000 0.0000  
 -15.1487 0.0000  
 -196.6635 0.0000  
 -461.8137 429.0784  
 -461.8137 -429.0784  
 POLES 11  
 -0.0370 0.0370  
 -0.0370 -0.0370  
 -15.3938 0.0000  
 -94.7504 386.4156  
 -94.7504 -386.4156  
 -376.9908 0.0000  
 -454.5252 0.0000  
 -9512.7345 11469.9451  
 -9512.7345 -11469.9451  
 -10239.6984 2725.0152  
 -10239.6984 -2725.0152  
 CONSTANT 2.459641E+19

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.TERF.HHE.00****Coordinates (ERTS89)**

Latitude: 43.6788N

Country: France

Longitude: 1.1133W

Municipality: Tercis-les-Bains

Elevation: 50 m

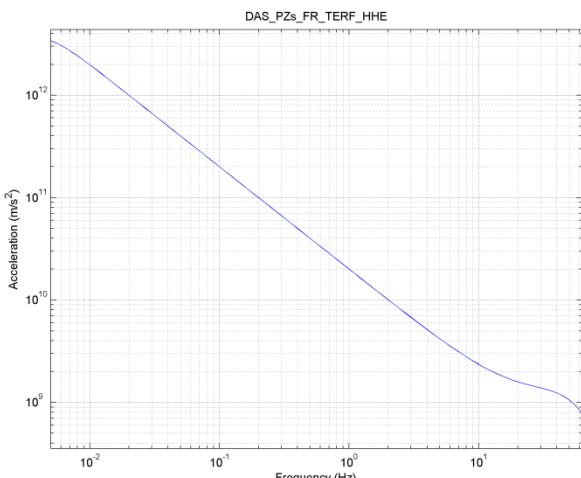
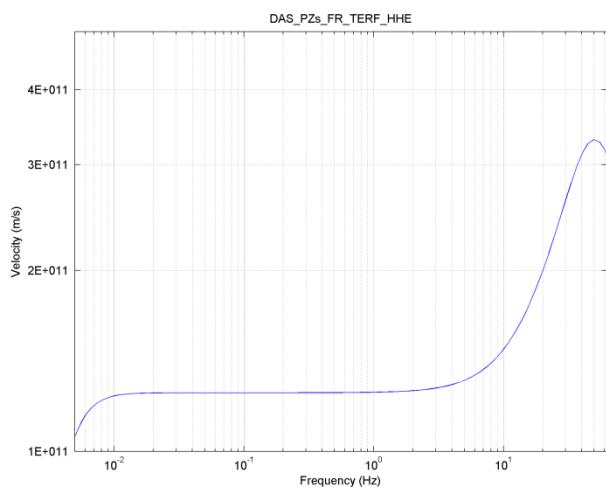
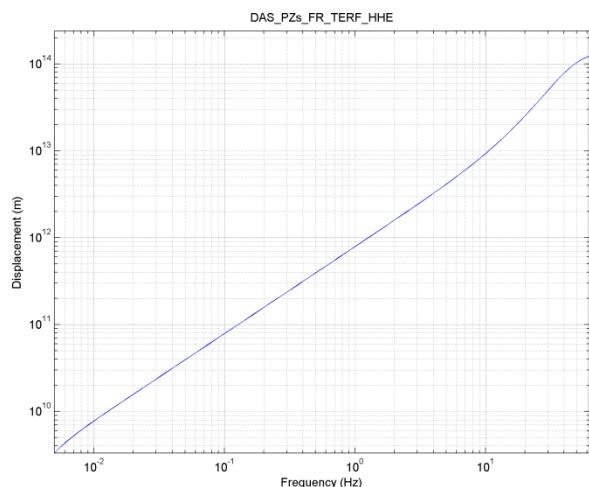
Owner: OMP

**Channel response**

Sensitivity	1.254000E+11
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100

ZEROS 6  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-91.6590 0.0000  
-160.0998 0.0000  
-3206.9979 0.0000  
POLES 7  
-0.0176 -0.0176  
-0.0176 0.0176  
-126.7003 0.0000  
-192.1258 -259.0995  
-192.1258 259.0995  
-557.7013 -1142.9984  
-557.7013 1142.9984  
CONSTANT 5.671735e+7

Amplitudes in nm and poles and zeros in rad/s

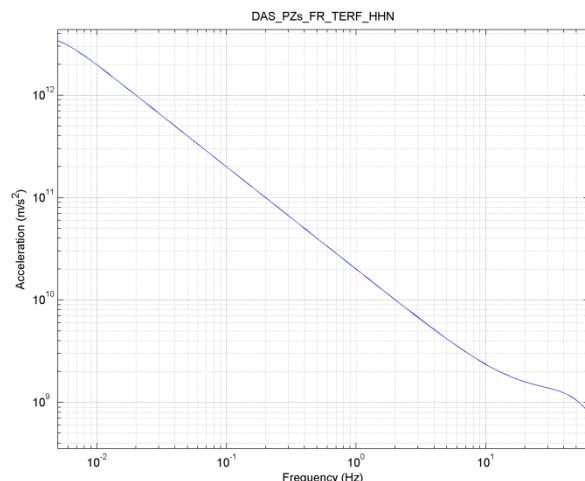
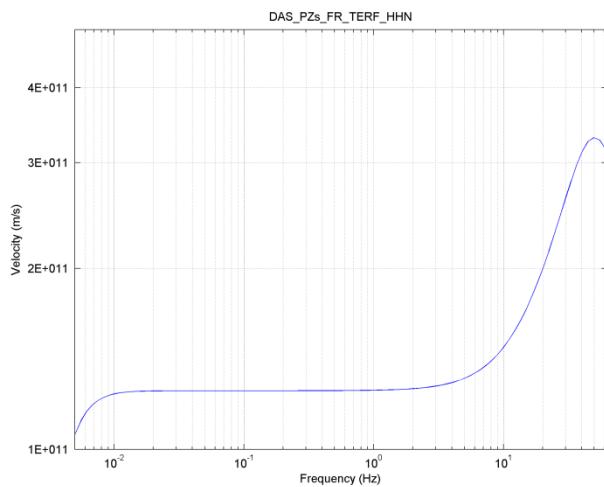
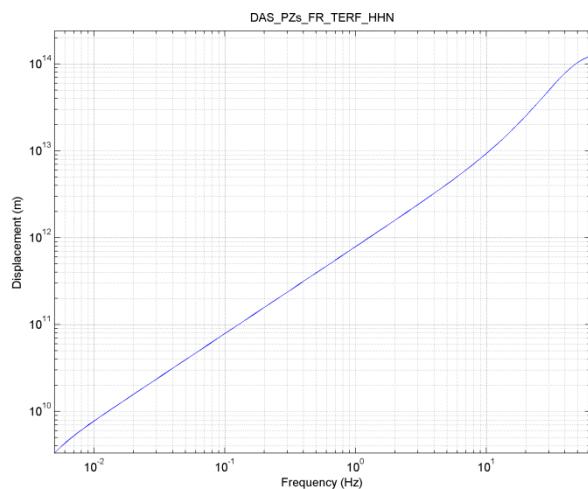


**NSCL code:****FR.TERF.HHN.00****Coordinates (ERTS89)**Latitude: **43.6788N**Country: **France**Longitude: **1.1133W**Municipality: **Tercis-les-Bains**Elevation: **50 m**Owner: **OMP****Channel response**

Sensitivity	<b>1.254000E+11</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>

ZEROS 6  
 0.0000 0.0000  
 0.0000 0.0000  
 0.0000 0.0000  
 -91.6590 0.0000  
 -160.0998 0.0000  
 -3206.9979 0.0000  
 POLES 7  
 -0.0176 -0.0176  
 -0.0176 0.0176  
 -126.7003 0.0000  
 -192.1258 -259.0995  
 -192.1258 259.0995  
 -557.7013 -1142.9984  
 -557.7013 1142.9984  
 CONSTANT 5.671735e+7

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.TERF.HHZ.00****Coordinates (ERTS89)**

Latitude: 43.6788N

Country: France

Longitude: 1.1133W

Municipality: Tercis-les-Bains

Elevation: 50 m

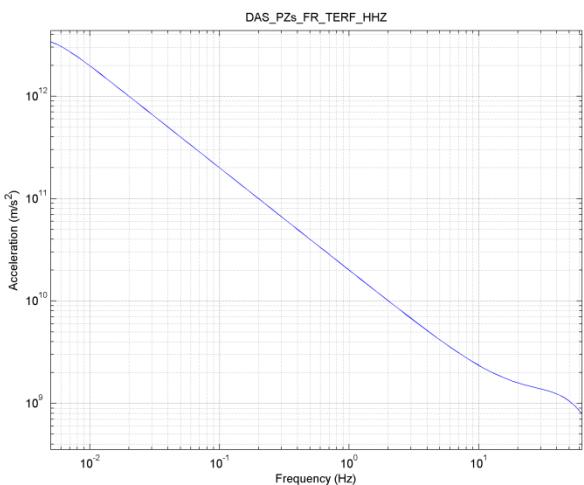
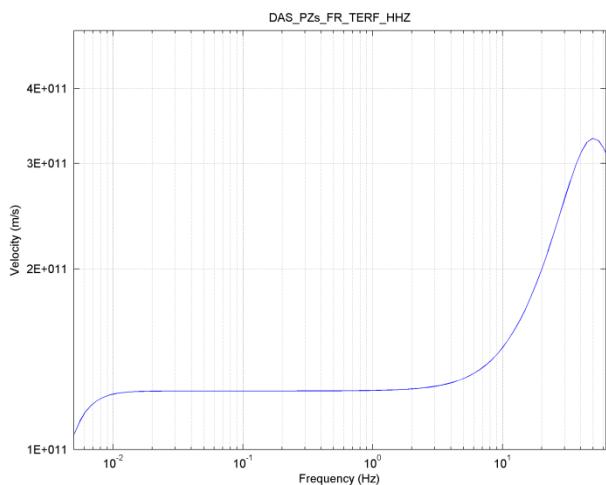
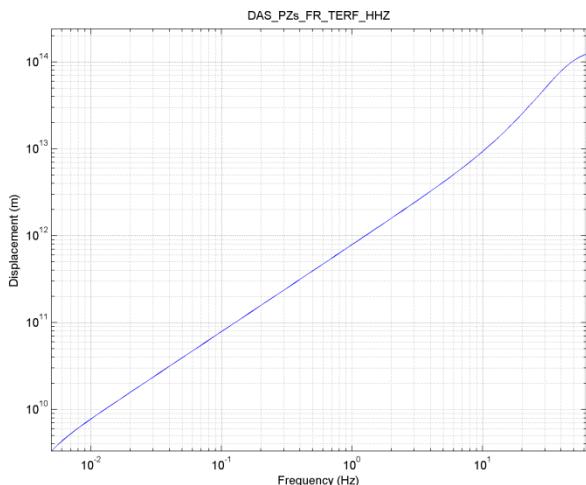
Owner: OMP

**Channel response**

Sensitivity	1.254000E+11
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100

ZEROS 6  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-91.6590 0.0000  
-160.0998 0.0000  
-3206.9979 0.0000  
POLES 7  
-0.0176 -0.0176  
-0.0176 0.0176  
-126.7003 0.0000  
-192.1258 -259.0995  
-192.1258 259.0995  
-557.7013 -1142.9984  
-557.7013 1142.9984  
CONSTANT 5.671735e+7

Amplitudes in nm and poles and zeros in rad/s





**NSCL code:****FR.URDF.HHE.00****Coordinates (ERTS89)**

Latitude: 43.4383N

Country: France

Longitude: 0.5931W

Municipality: Urdès

Elevation: 120 m

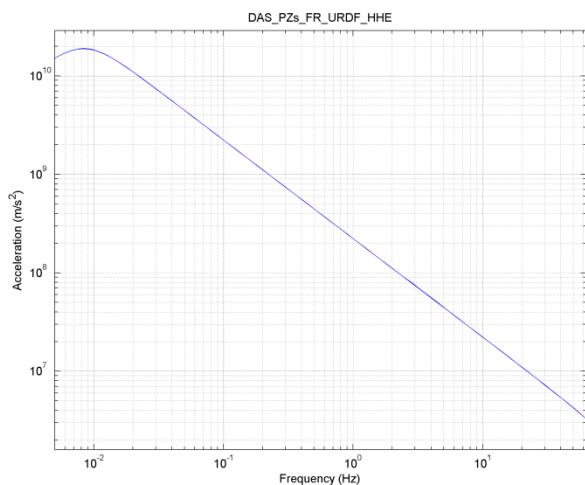
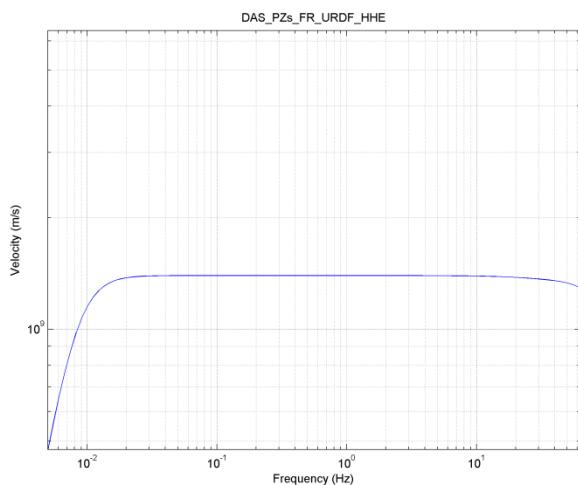
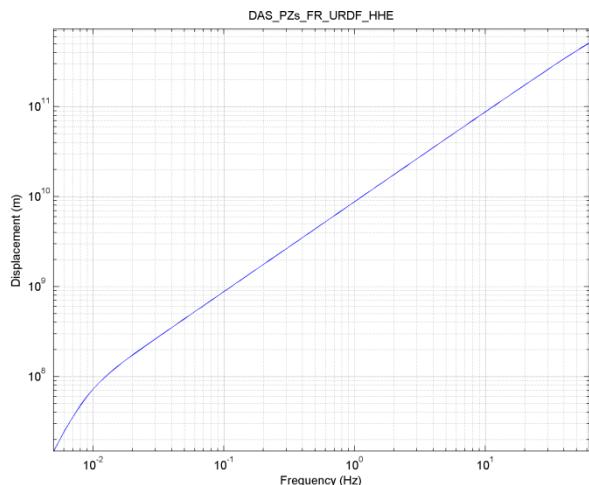
Owner: OMP

**Channel response**

Sensitivity	1.396000E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100

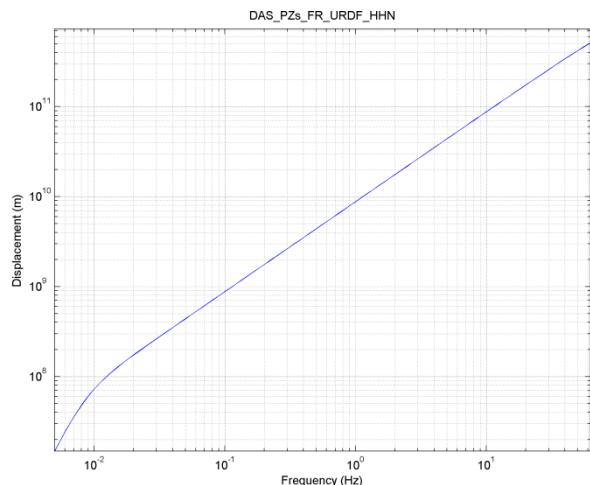
ZEROS 4  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-434.1049 0.0000  
POLES 7  
-0.0369 0.0371  
-0.0369 -0.0371  
-337.0926 0.0000  
-373.9120 475.5111  
-373.9120 -475.5111  
-588.4198 1507.9632  
-588.4198 -1507.9632  
CONSTANT 1.039692e+12

Amplitudes in nm and poles and zeros in rad/s



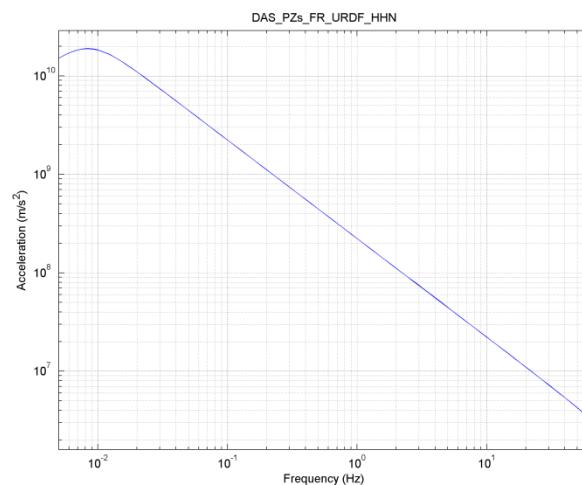
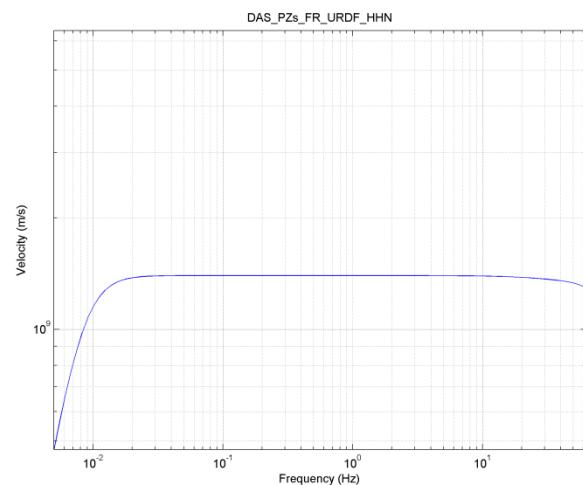
**NSCL code:****FR.URDF.HHN.00****Coordinates (ERTS89)**Latitude: **43.4383N**Country: **France**Longitude: **0.5931W**Municipality: **Urdès**Elevation: **120 m**Owner: **OMP****Channel response**

Sensitivity	<b>1.396000E+09</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>



ZEROS 4
0.0000 0.0000
0.0000 0.0000
0.0000 0.0000
-434.1049 0.0000
POLES 7
-0.0369 0.0371
-0.0369 -0.0371
-337.0926 0.0000
-373.9120 475.5111
-373.9120 -475.5111
-588.4198 1507.9632
-588.4198 -1507.9632
CONSTANT 1.039692e+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****FR.URDF.HHZ.00****Coordinates (ERTS89)**

Latitude: 43.4383N

Country: France

Longitude: 0.5931W

Municipality: Urdès

Elevation: 120 m

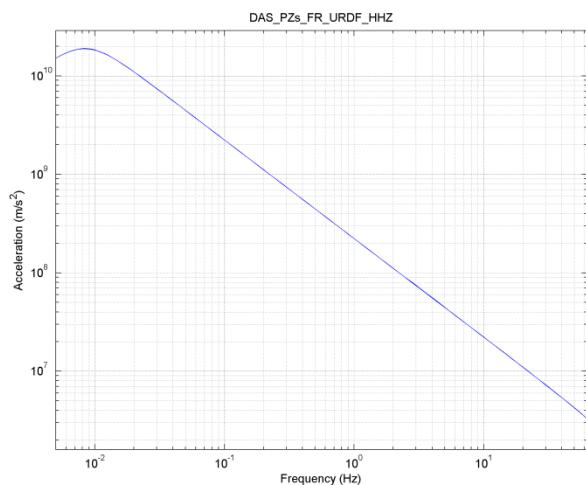
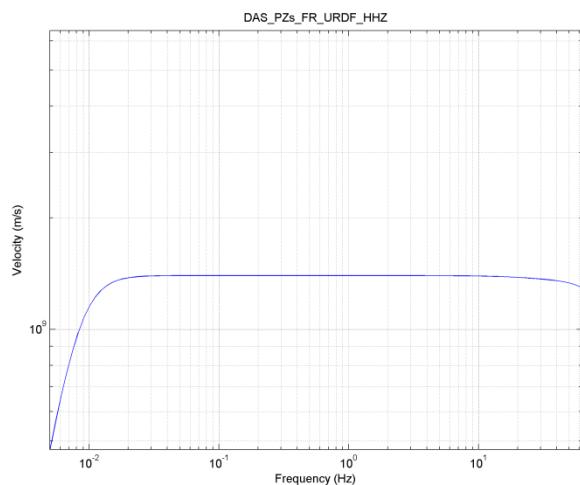
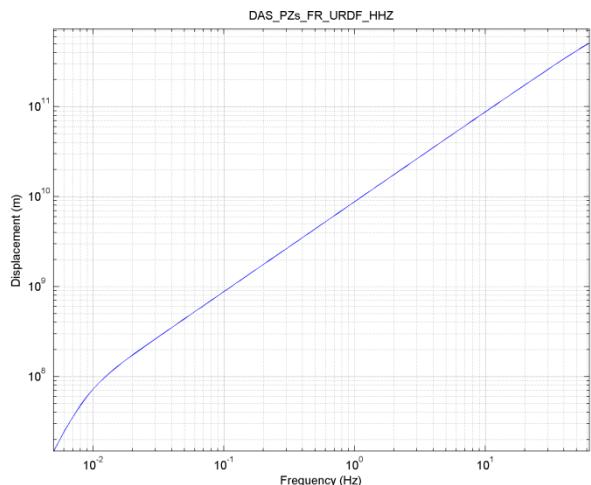
Owner: OMP

**Channel response**

Sensitivity	1.396000E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100

ZEROS 4  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
-434.1049 0.0000  
POLES 7  
-0.0369 0.0371  
-0.0369 -0.0371  
-337.0926 0.0000  
-373.9120 475.5111  
-373.9120 -475.5111  
-588.4198 1507.9632  
-588.4198 -1507.9632  
CONSTANT 1.039692e+12

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.VIES.HNE****Coordinates (ERTS89)**

Latitude: 42.7027N

Country: Spain

Longitude: 0.7981E

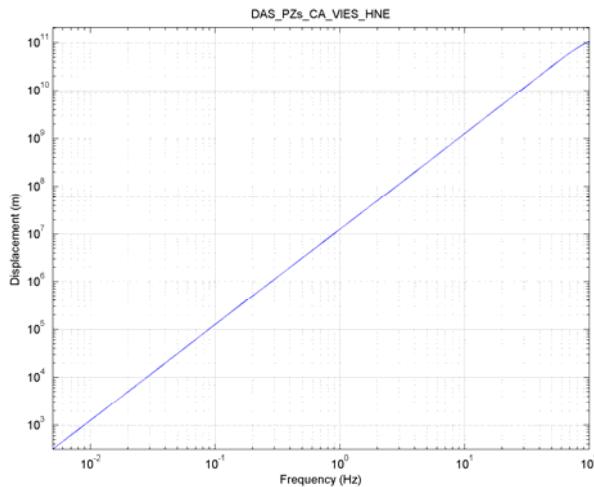
Municipality: Vielha

Elevation: 986 m

Owner: IGC

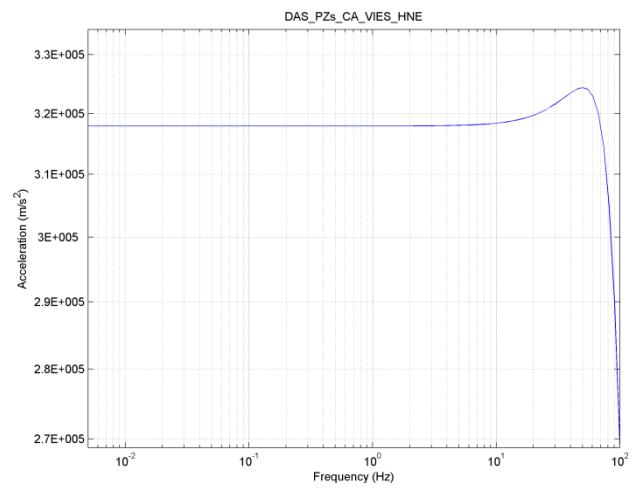
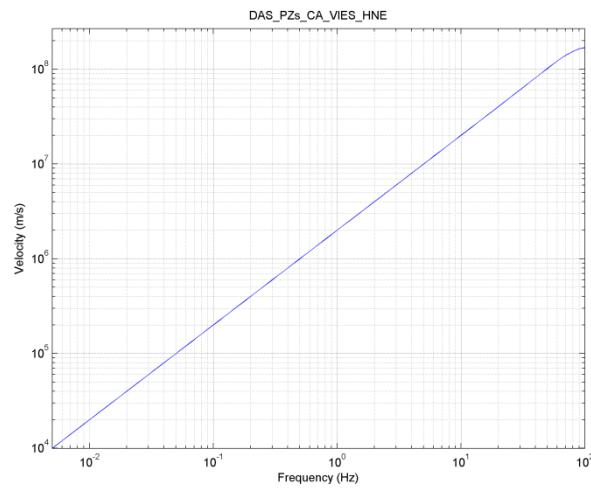
**Channel response**

Sensitivity	3.179060E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.610265E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.VIES.HNN****Coordinates (ERTS89)**

Latitude: 42.7027N

Country: Spain

Longitude: 0.7981E

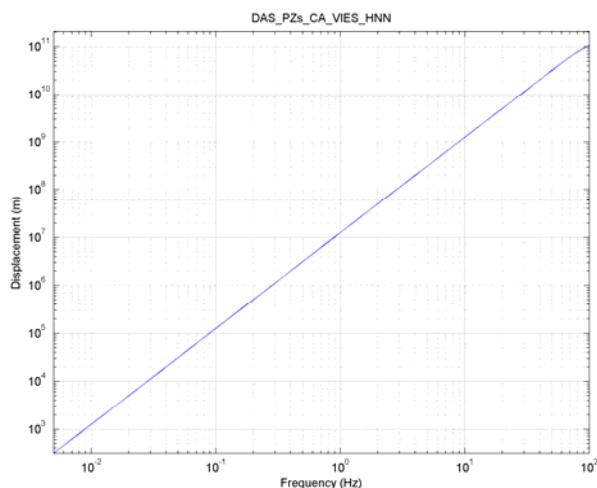
Municipality: Vielha

Elevation: 986 m

Owner: IGC

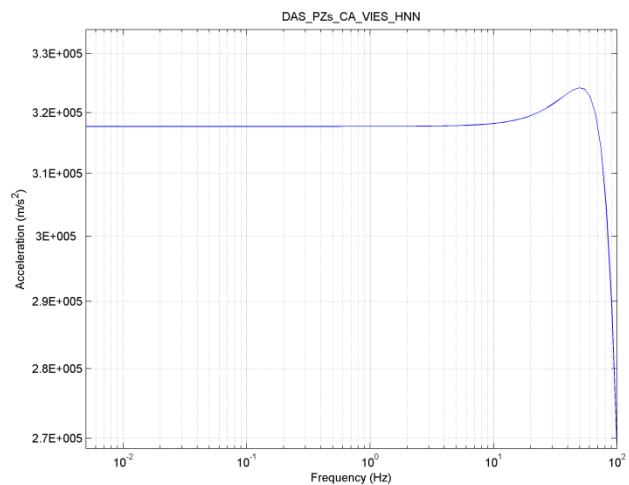
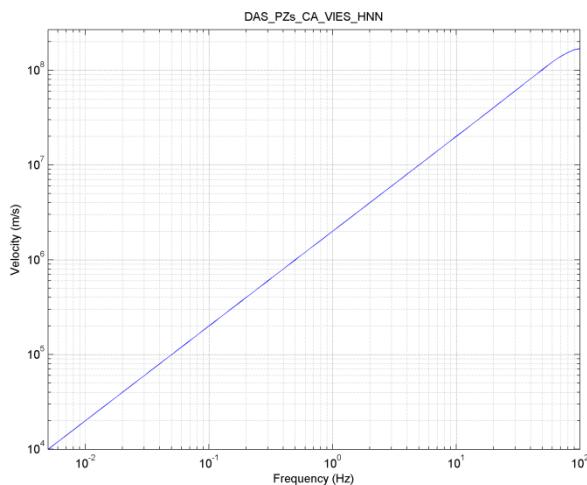
**Channel response**

Sensitivity	3.177028E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.604122E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****CA.VIES.HNZ****Coordinates (ERTS89)**

Latitude: 42.7027N

Country: Spain

Longitude: 0.7981E

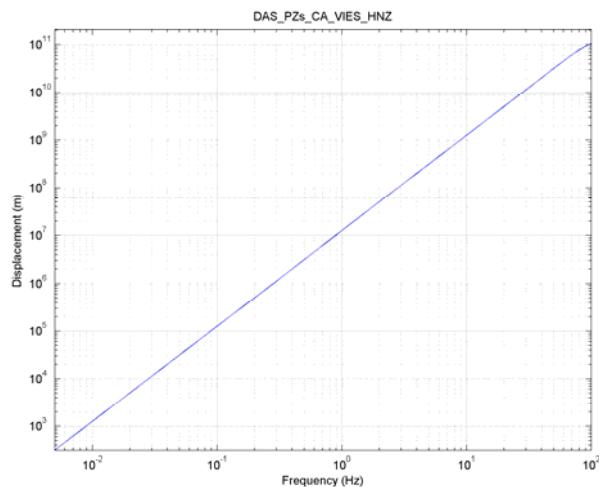
Municipality: Vielha

Elevation: 986 m

Owner: IGC

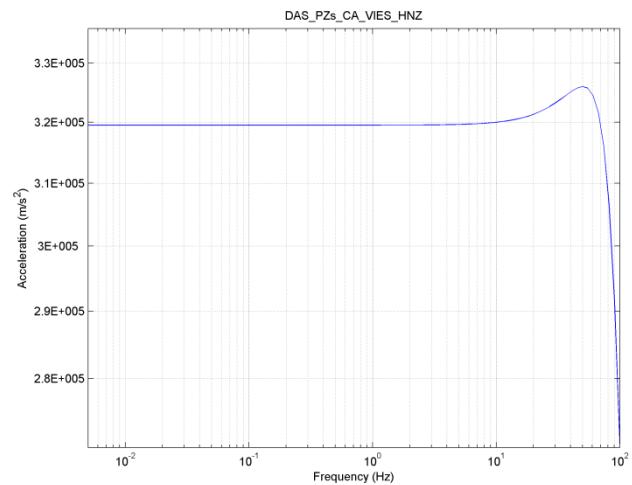
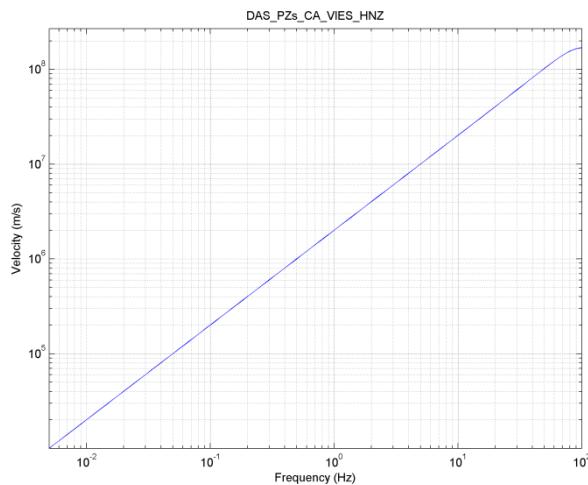
**Channel response**

Sensitivity	3.195320E+05
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s <sup>2</sup>
Sample rate (sps)	200



ZEROS 2  
0.0000 0.0000  
0.0000 0.0000  
POLES 4  
-400.8213 -567.9145  
-400.8213 567.9145  
-1317.3070 0.0000  
-4749.4470 0.0000  
CONSTANT 9.659418E+8

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.YARA.HHE****Coordinates (ERTS89)**

Latitude: 42.6477N

Country: Spain

Longitude: 1.1902W

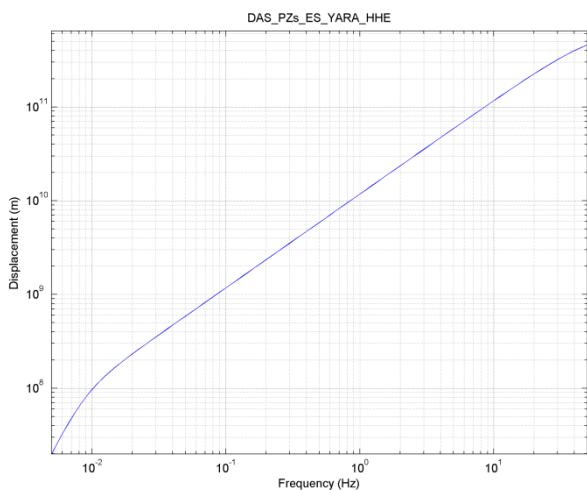
Municipality: Arangoiti

Elevation: 1303 m

Owner: IGN

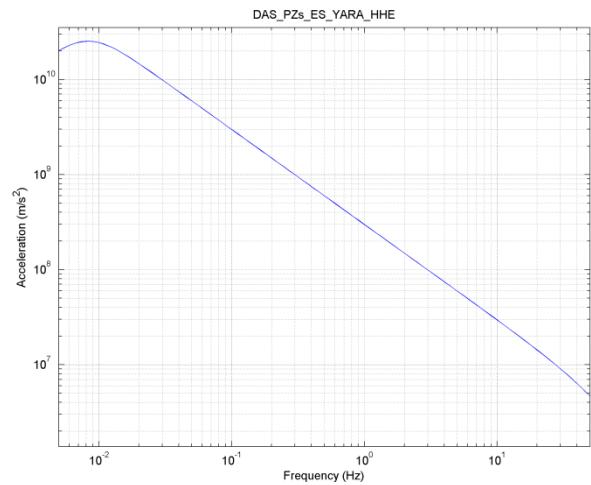
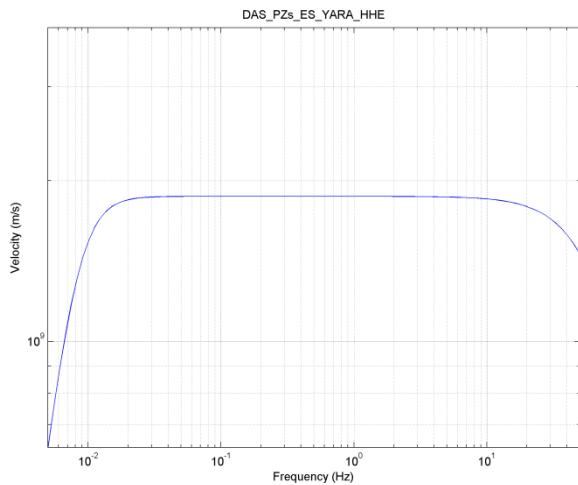
**Channel response**

Sensitivity	1.870810E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
CONSTANT 1.069181E+9

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.YARA.HHN****Coordinates (ERTS89)**

Latitude: 42.6477N

Country: Spain

Longitude: 1.1902W

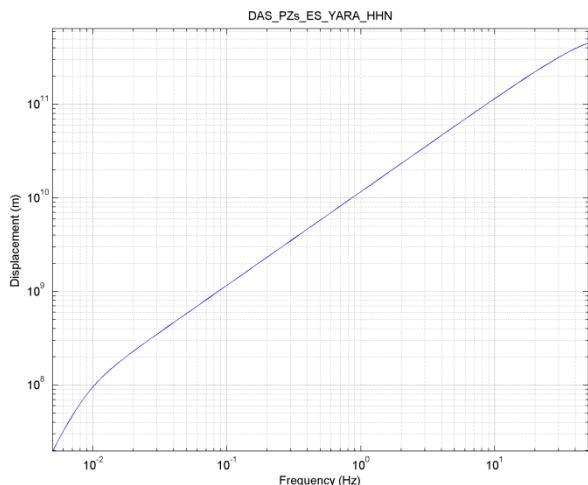
Municipality: Arangoiti

Elevation: 1303 m

Owner: IGN

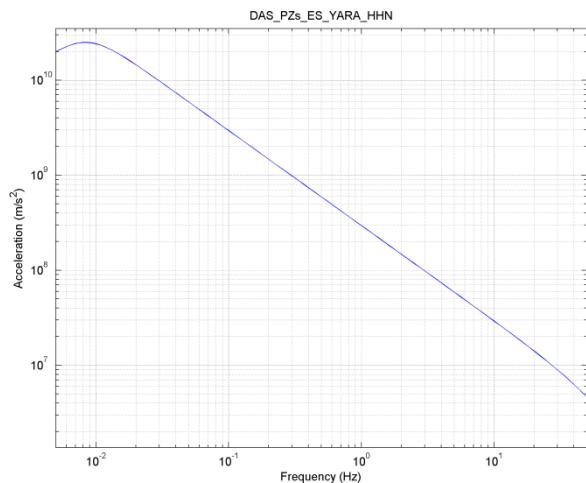
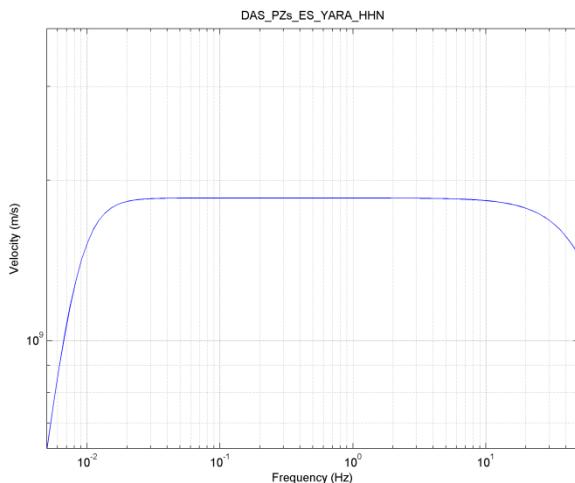
**Channel response**

Sensitivity	1.852640E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
CONSTANT 1.058786E+9

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:****ES.YARA.HHZ****Coordinates (ERTS89)**

Latitude: 42.6477N

Country: Spain

Longitude: 1.1902W

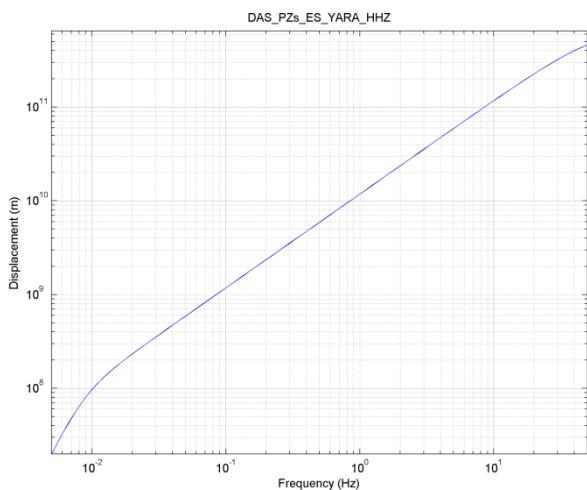
Municipality: Arangoiti

Elevation: 1303 m

Owner: IGN

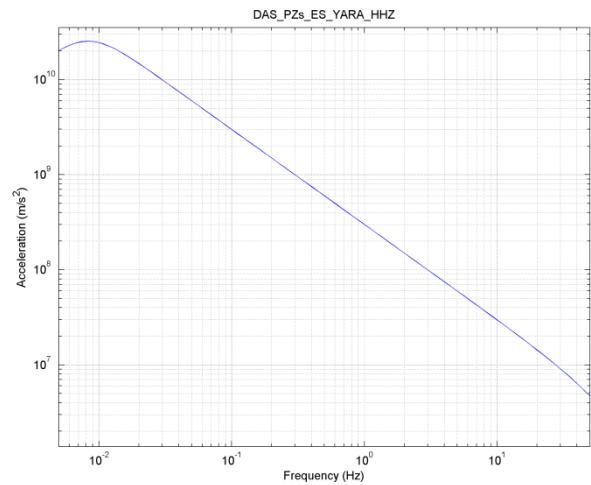
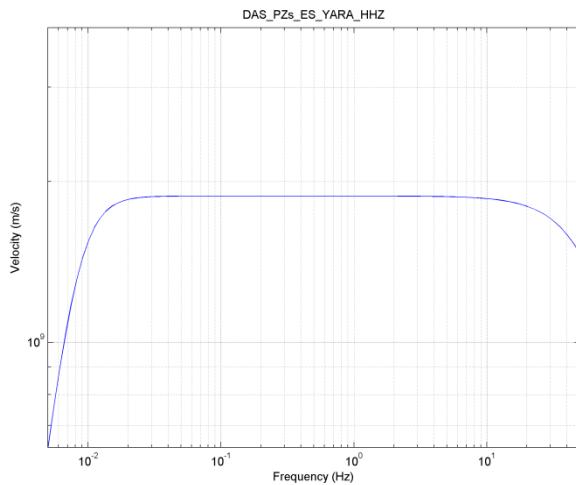
**Channel response**

Sensitivity	1.878900E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
CONSTANT 1.073808E+9

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:** **ES.YSOS.HHE**

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### Coordinates (ERTS89)

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Latitude: 42.4554N

Country: Spain

Longitude: 1.1470W

Municipality: Sos del Rey Católico

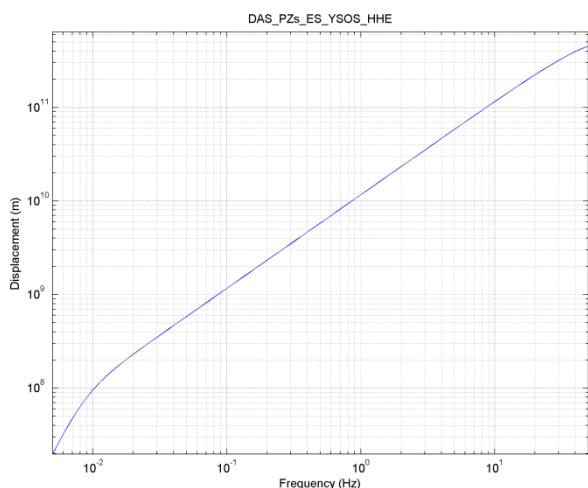
Elevation: 881 m

Owner: IGN

### Channel response

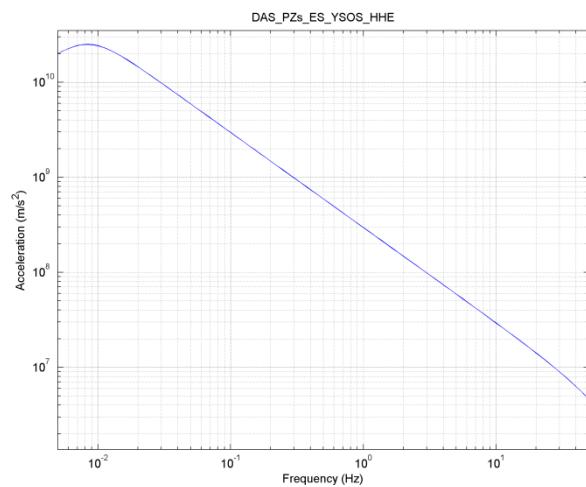
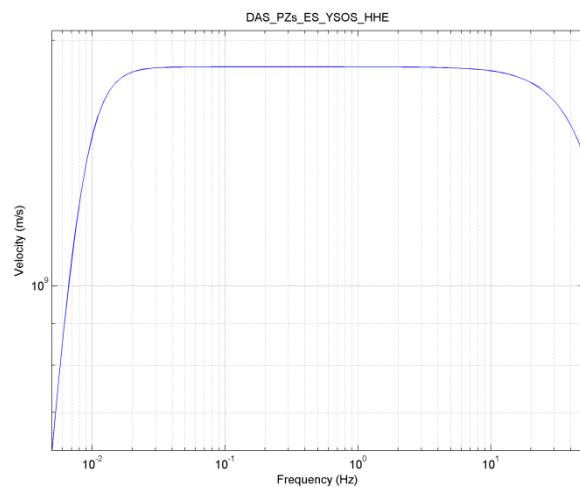
---

Sensitivity	1.855750E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
CONSTANT 1.060579E+9

Amplitudes in nm and poles and zeros in rad/s



**NSCL code:** **ES.YSOS.HHN**

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### Coordinates (ERTS89)

---

Latitude: **42.4554N**

Country: **Spain**

Longitude: **1.1470W**

Municipality: **Sos del Rey Católico**

Elevation: **881 m**

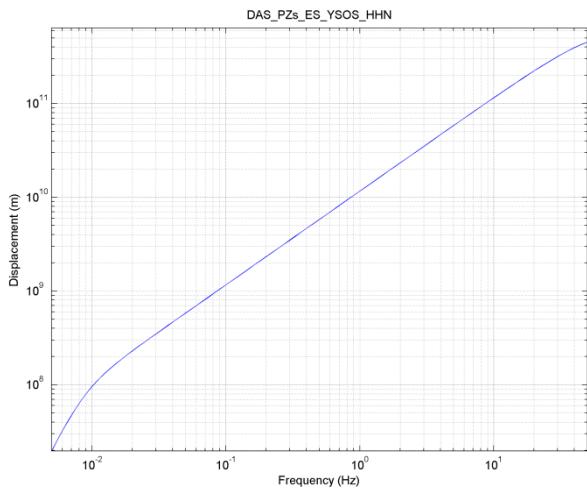
Owner: **IGN**

### Channel response

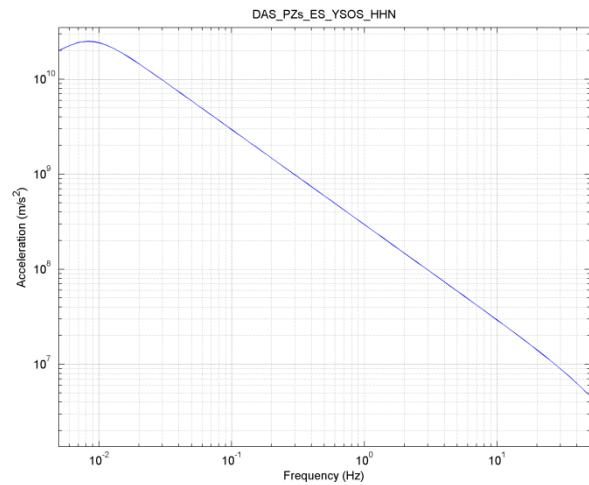
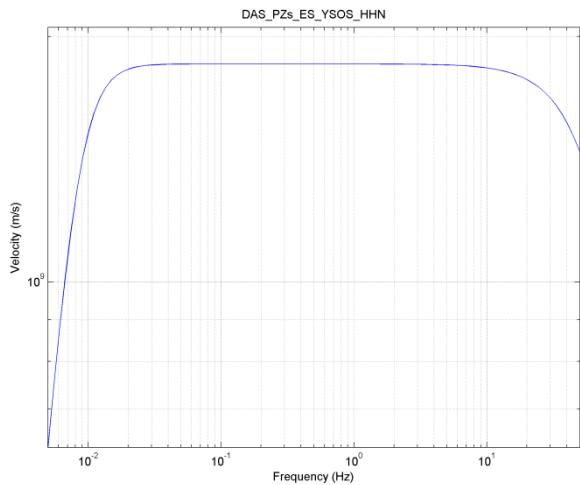
---

Sensitivity	<b>1.851340E+09</b>
Freq. of sensitivity (Hz)	<b>1</b>
Units of sensitivity	<b>Counts/m/s</b>
Sample rate (sps)	<b>100</b>

ZEROS 3
0.0000 0.0000
0.0000 0.0000
0.0000 0.0000
POLES 5
-0.0370 -0.0370
-0.0370 0.0370
-1130.9700 0.0000
-1005.3100 0.0000
-502.6550 0.0000
CONSTANT 1.058058E+9



Amplitudes in nm and poles and zeros in rad/s



**NSCL code:** **ES.YSOS.HHZ**

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### Coordinates (ERTS89)

---

Latitude: 42.4554N

Country: Spain

Longitude: 1.1470W

Municipality: Sos del Rey Católico

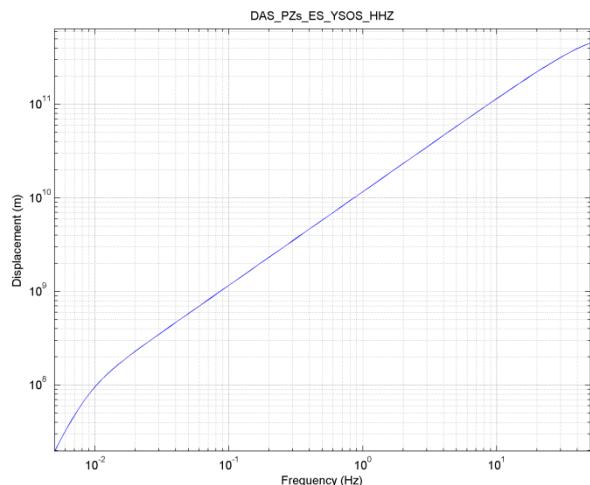
Elevation: 881 m

Owner: IGN

### Channel response

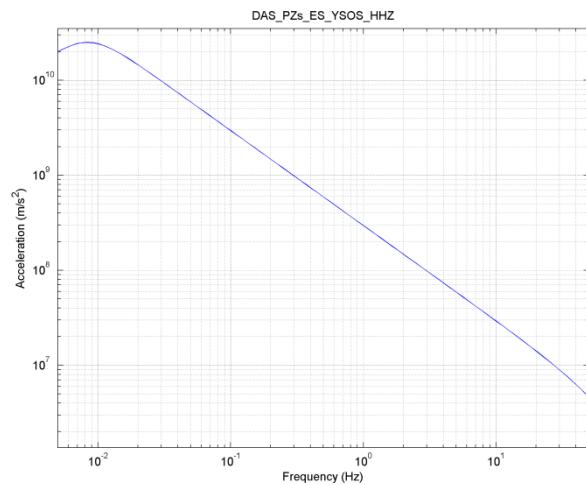
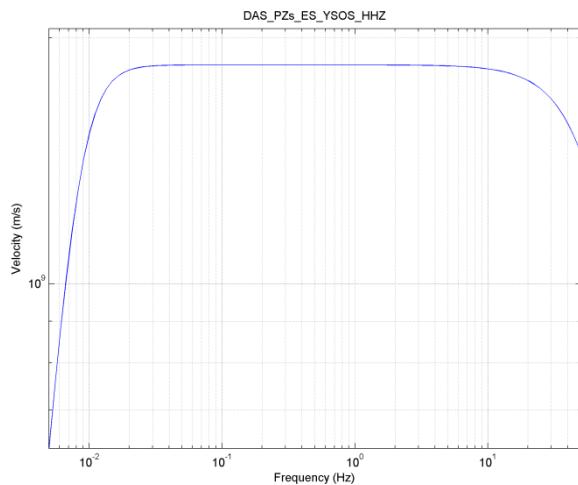
---

Sensitivity	1.855750E+09
Freq. of sensitivity (Hz)	1
Units of sensitivity	Counts/m/s
Sample rate (sps)	100



ZEROS 3  
0.0000 0.0000  
0.0000 0.0000  
0.0000 0.0000  
POLES 5  
-0.0370 -0.0370  
-0.0370 0.0370  
-1130.9700 0.0000  
-1005.3100 0.0000  
-502.6550 0.0000  
CONSTANT 1.059417E+9

Amplitudes in nm and poles and zeros in rad/s





## Appendix 8. **Cosine taper definition**

As shown in **!Error! No se encuentra el origen de la referencia.**, four parameters are set to define the cosine taper for each SCNL. These four parameters are:

- TaperLowFreqOff
- TaperLowFreqOn
- TaperHighFreqOn
- TaperhighFreqOff

For the high frequencies band of the tapper, values of corresponding parameters will be set to the standards values of 90% of Nyquist frequency for 'TaperHighFreqOn' and Nyquist frequency for 'TaperLowFreqOff'.

For low frequencies band, some tests have been made to decide the most adequate values of 'TaperLowFreqOff' and 'TaperLowFreqOn'. For these tests, the relation between both parameters has been fixed, according with Equation 1.

$$\text{TaperLowFreqOff} = \text{TaperLowFreqOn} - 0.05 \text{ Hz} \quad \text{[Equation 1]}$$

So, tests have been focused to determine the proper value of the parameter 'TaperLowFreqOn'. For that we have considered accelerometric waveform data provided by IGC and BRGM corresponding to a M=3.7 earthquake with the following location information<sup>5</sup>:

- Origin Time (UT): 19/12/2010\_06:08
- Latitude: 41.86 °N
- Longitude: 2.80 °E
- Depth: 2 km

For this earthquake we have processed data of 24 channels corresponding to 9 accelerometric stations. For these channels we have computed the values of PGA, PGV and PGD considering different values of the parameter 'TaperLowFreqOn' since 0.1 Hz to 5.05 Hz, focusing the study in the band between 0.1 Hz and 1 Hz.

Results of computation have been compared with results provided by the IGC's seismologists and the differences have been analyzed and shown at the following sections.

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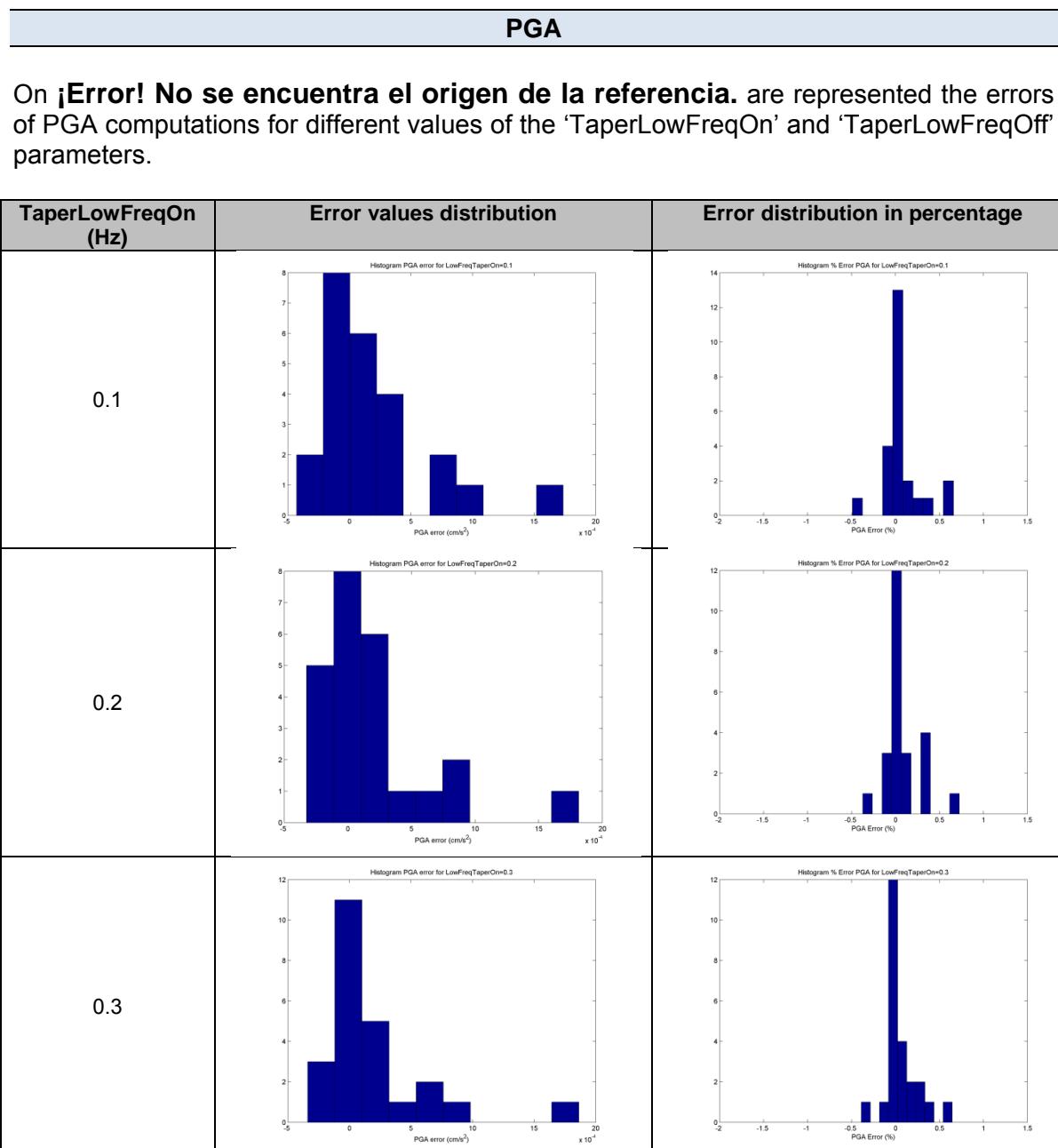
<sup>5</sup> Information provided by IGC

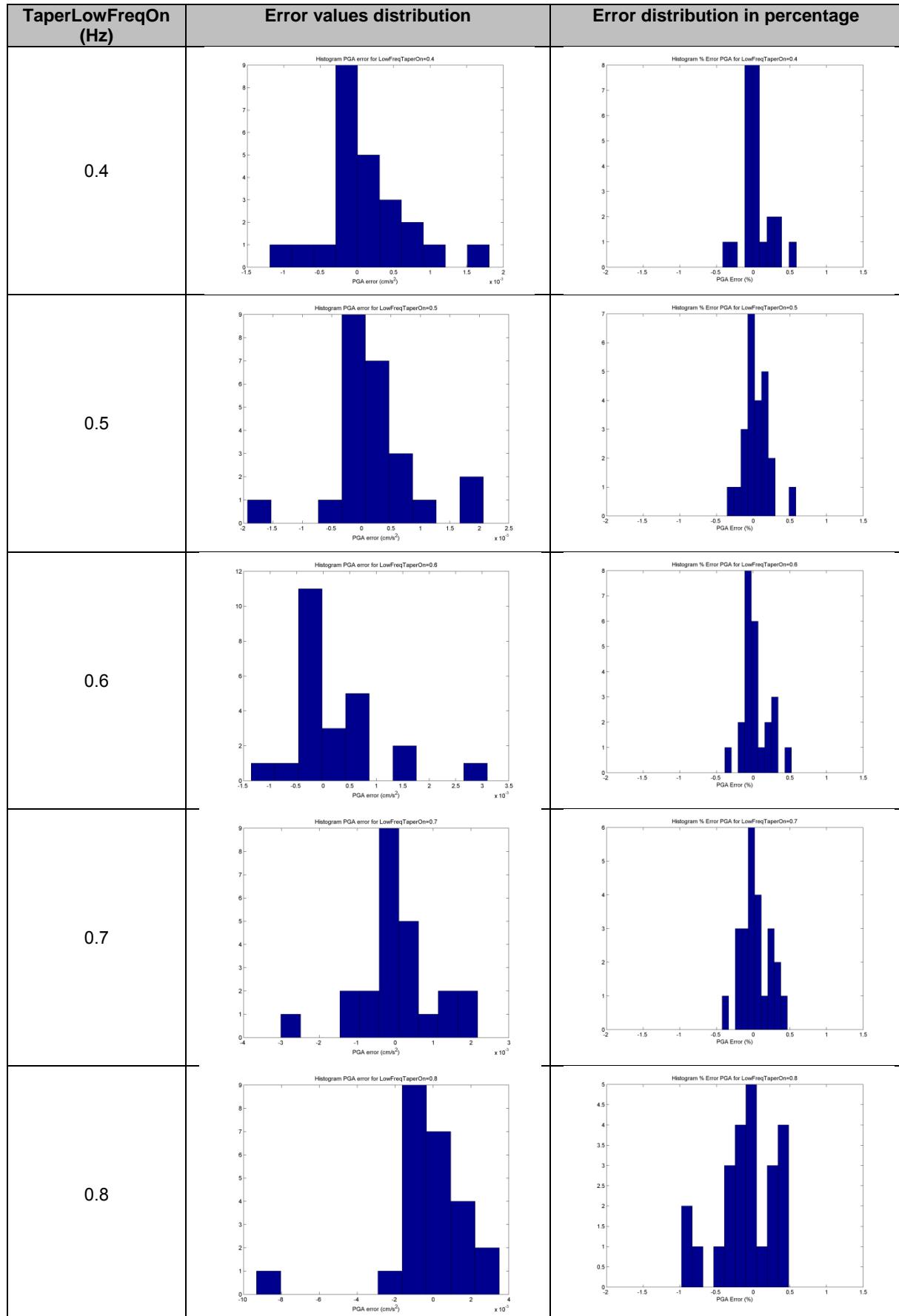
- **Results**

This section contains results of the analysis of errors of computing the PGA, PGV and PGD using DARACOM and reference values provided by IGC, for each available SCNL. Note that errors have been computed according Equation 2.

$$\text{Error} = \text{Value computed by DARACOM} - \text{Reference value}$$

[Equation 2]





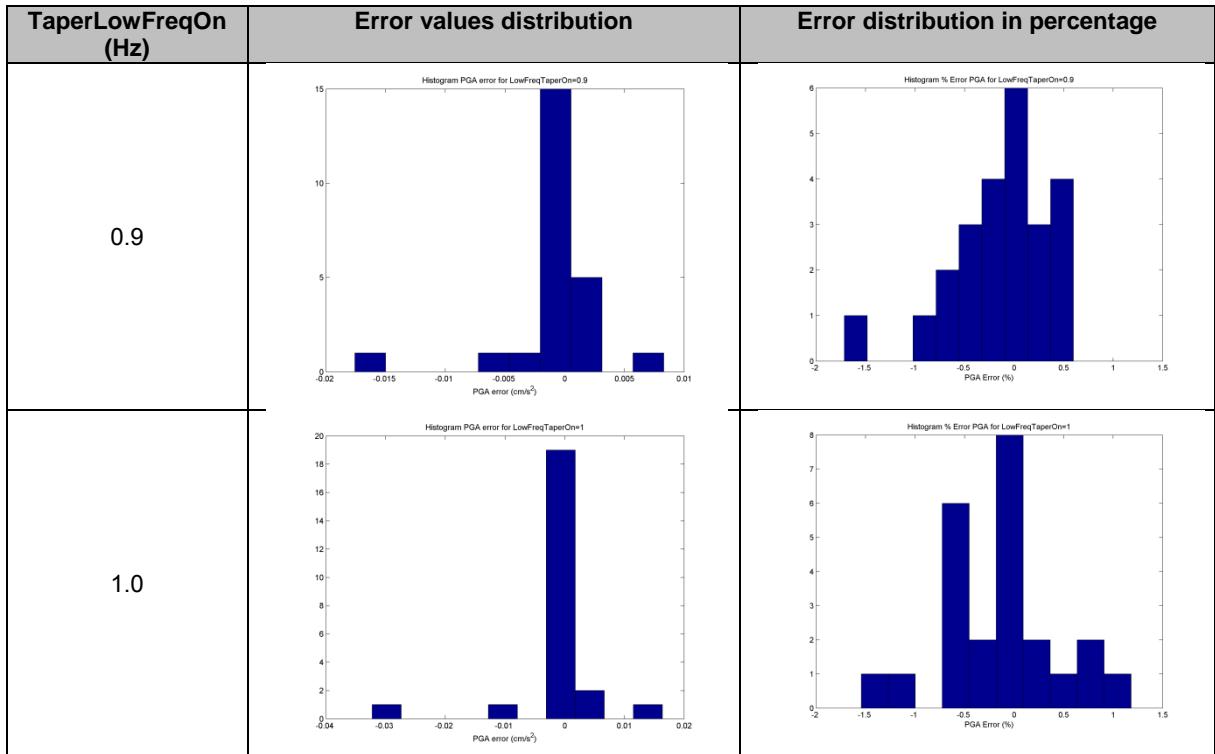


Table 19 - Histograms of errors for PGA using data of 24 SCNLs.

At histograms represented on the above table it is observed that for values of 'TaperLowFreqOn' between 0.1 Hz and 0.7 Hz, all errors are between -0.5% and 0.5%. This behavior is also shown on **Error! No se encuentra el origen de la referencia.**, where we can observe that above near 0.7 Hz the maximum and mean error increases.

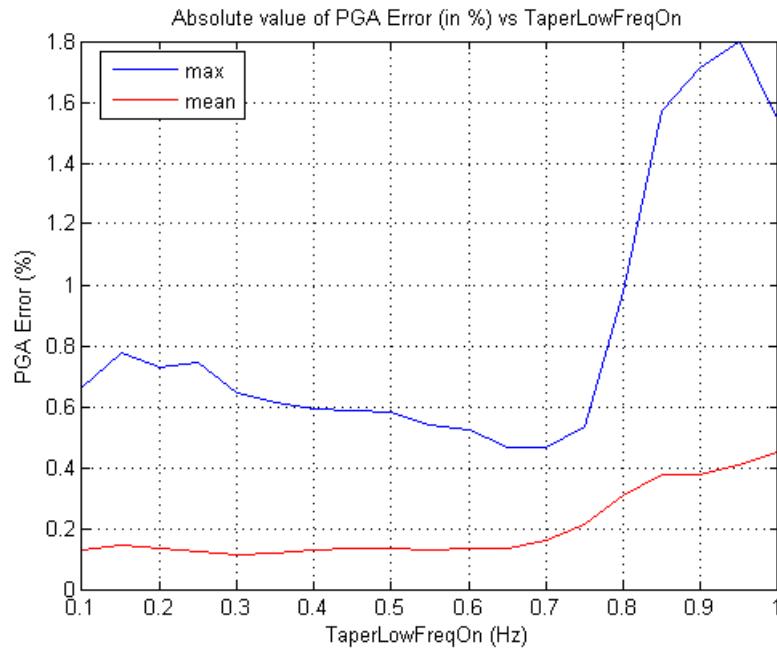
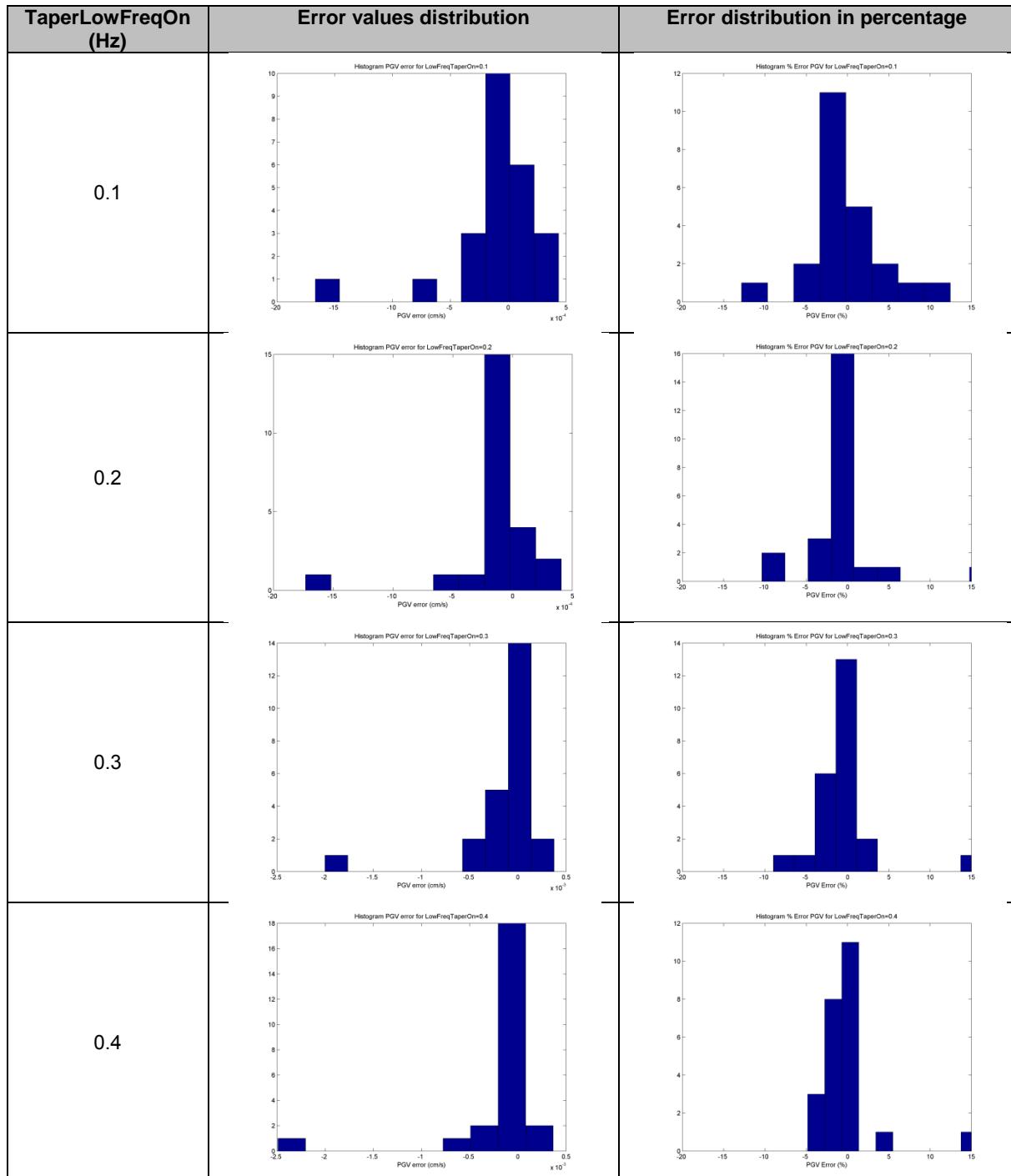


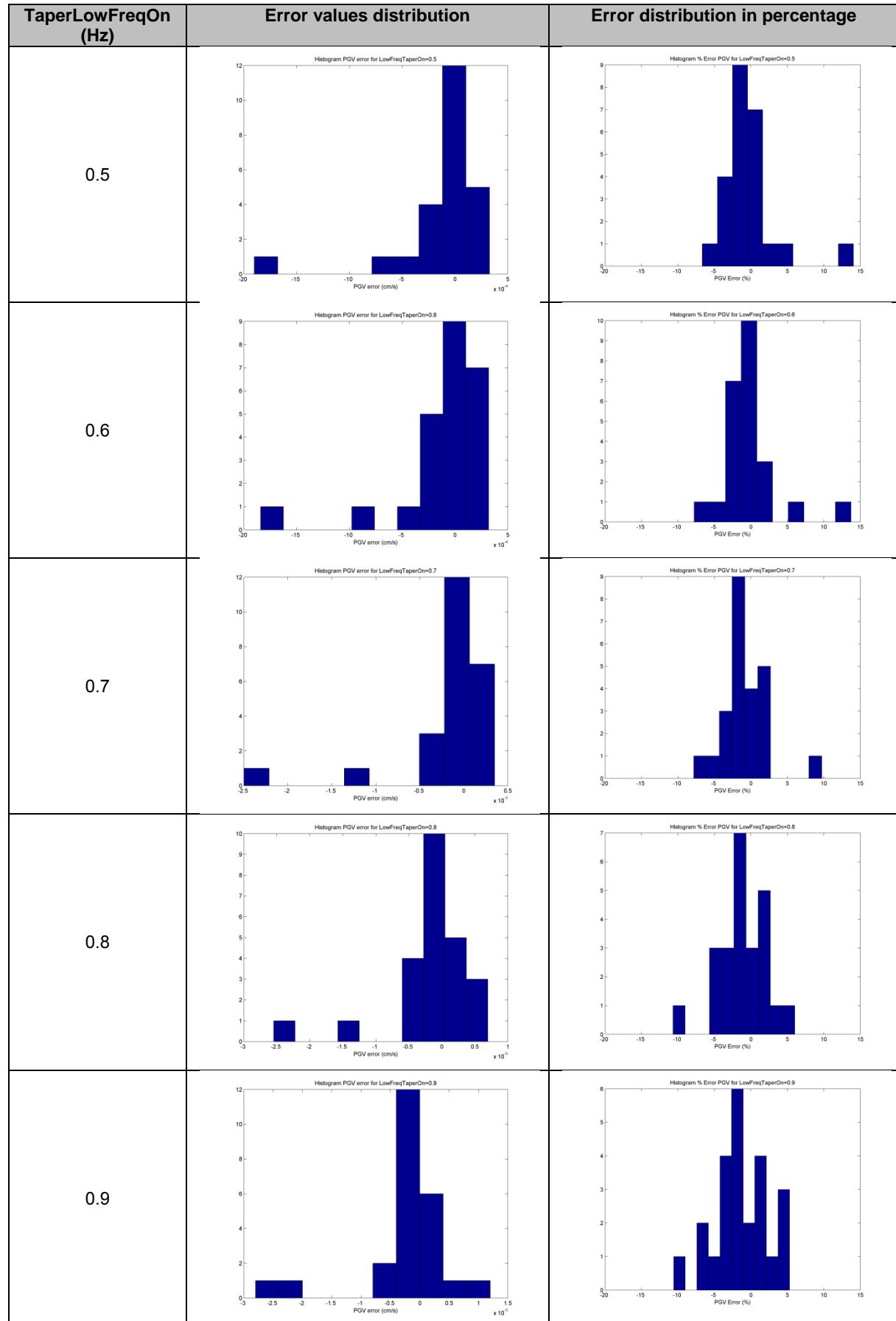
Figure 7 - Absolute value of PGA Error in % vs TaperLowFreqOn



## PGV

As in the case of PGA, on **Error! No se encuentra el origen de la referencia.** are represented the errors of PGV computations for different values of the 'TaperLowFreqOn' and 'TaperLowFreqOff' parameters.





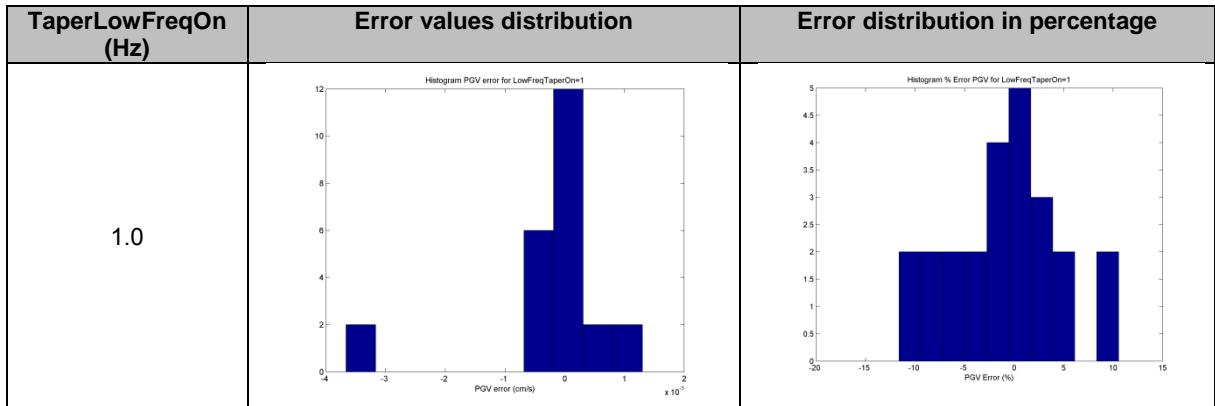


Figure 8 - Histograms of errors for PGV using data of 24 SCNLs.

Histograms on the above table shown that for values of 'TaperLowFreqOn' between 0.4 Hz and 0.7 Hz, the errors are a little less dispersed than in the other cases, but this is better shown on **Error! No se encuentra el origen de la referencia.**, where we can observe that minimum value of maximum error is near 0.7 Hz and the minimum value of mean error is near 0.4 Hz.

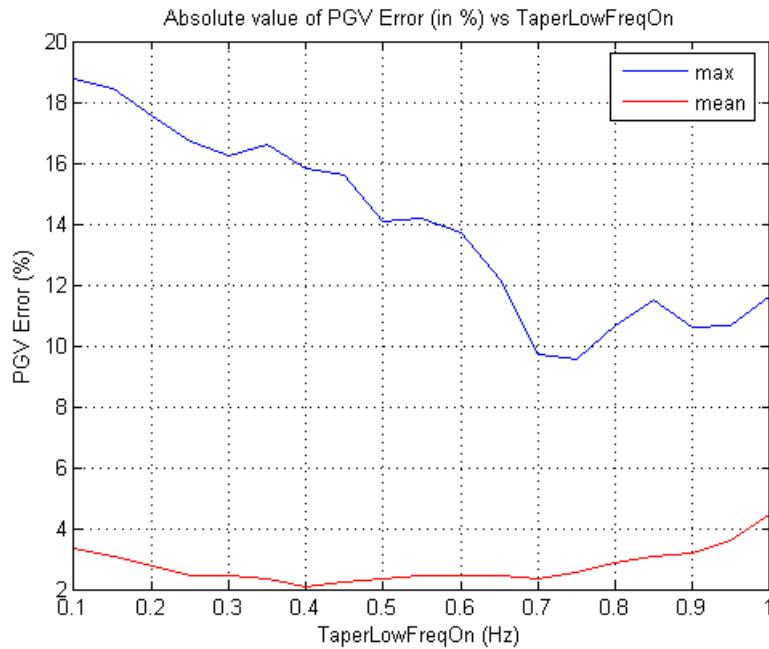
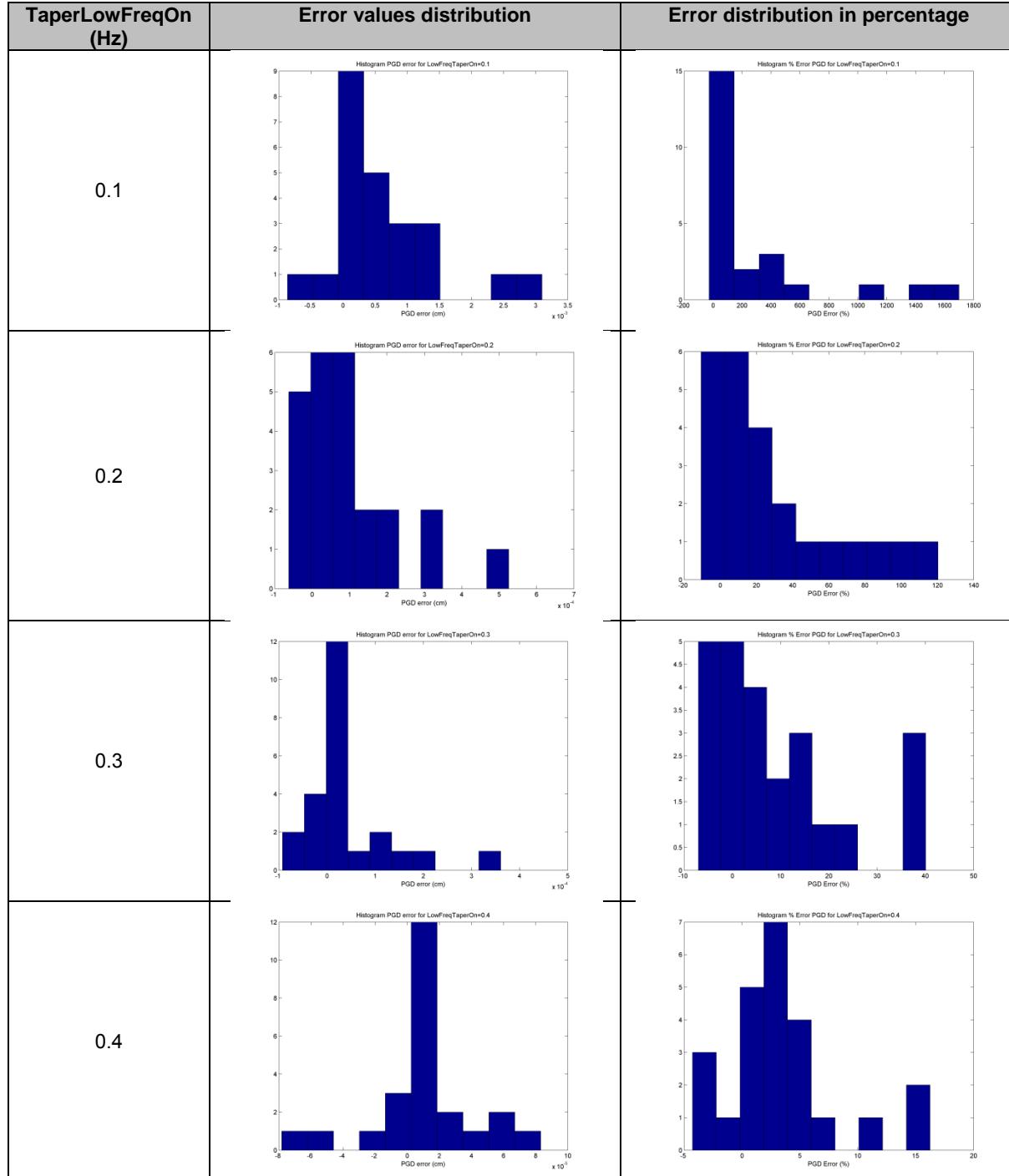
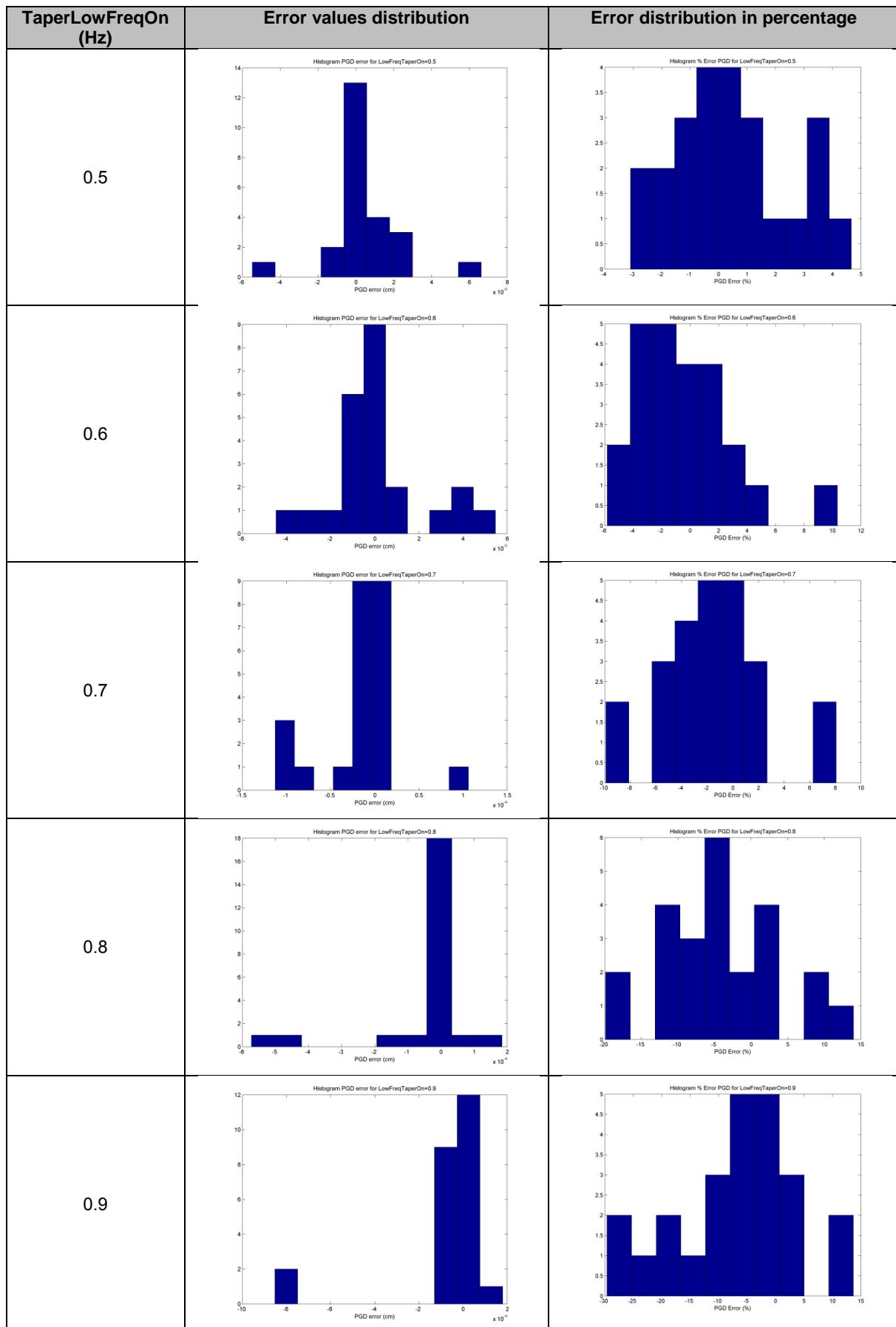


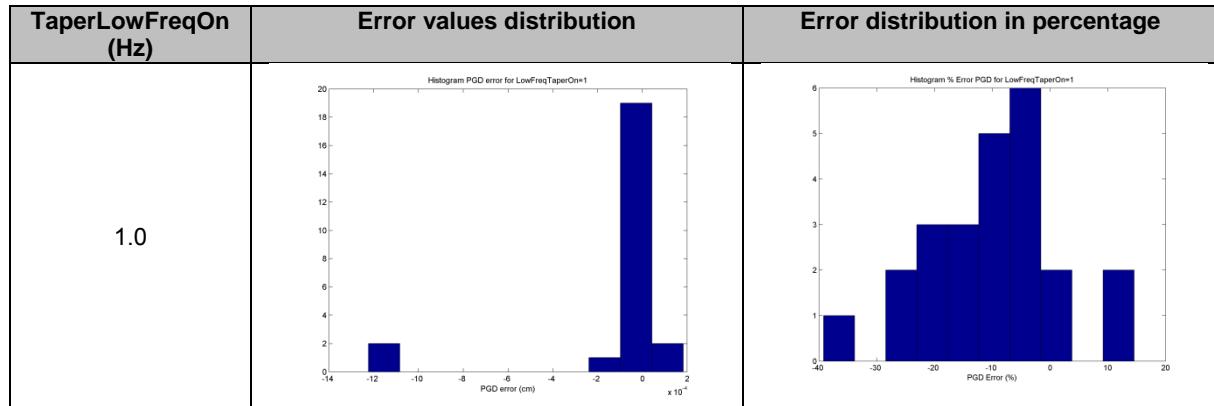
Figure 9 - Absolute value of PGV Error in % vs TaperLowFreqOn

## PGD

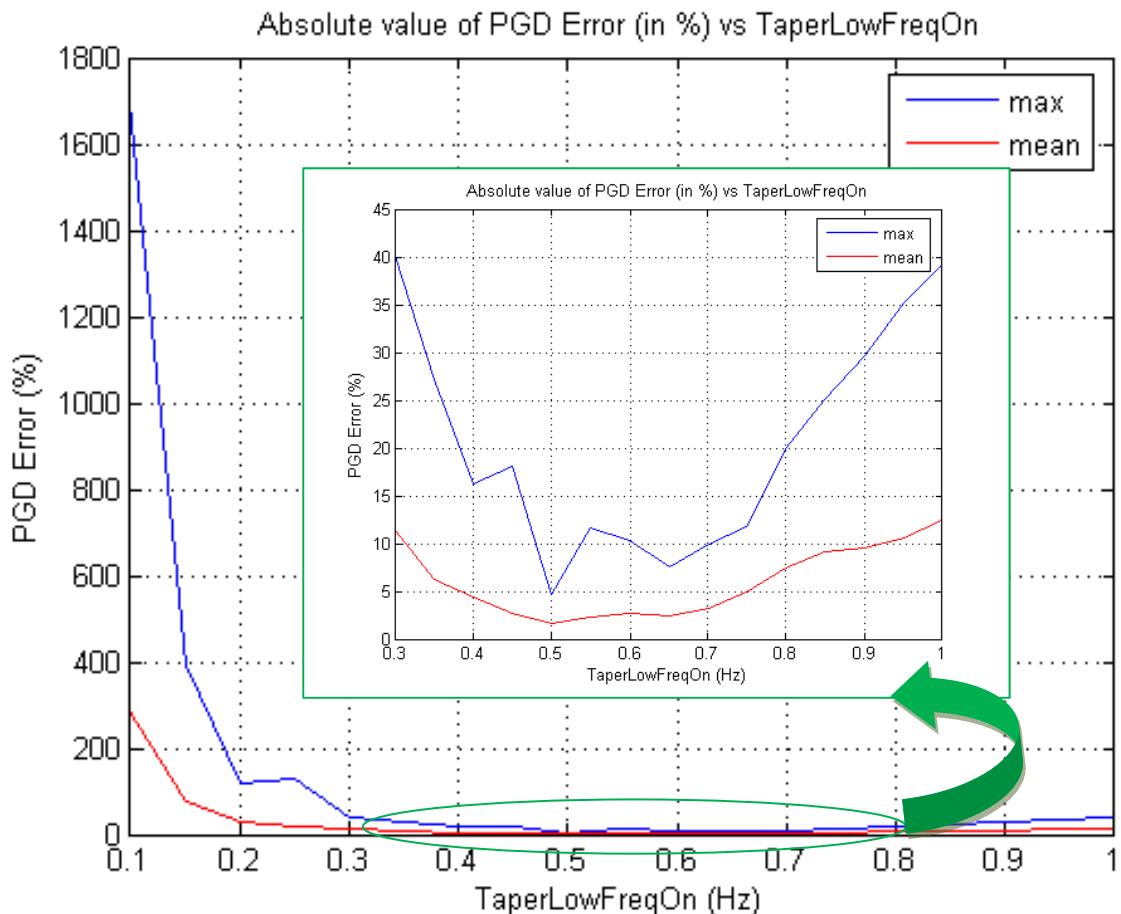
As in the cases of PGA and PGV, on the following table are represented the errors of PGD computations for different values of the 'TaperLowFreqOn' and 'TaperLowFreqOff' parameters.





**Figure 10 - Histograms of errors for PGD using data of 24 SCNLs.**

Plots on the above table shown that for values of 'TaperLowFreqOn' between 0.3 Hz and 1.0 Hz, the errors much lower than for frequency values below 0.3 Hz. Also we can observe this effect on **Error! No se encuentra el origen de la referencia.** where also we can clearly observe that this error reach a minimum for 0.5 Hz.

**Figure 11 - Absolute value of PGD Error in % vs TaperLowFreqOn**

- **Conclusions**

Considering all results shown on previous section we can ensure that the proper value for 'TaperLowFreqOn' parameter is between 0.3 Hz and 0.7 Hz; but to sharpen it we have computed the mean error between PGA, PGV and PGV, as shown below, for values of 'TaperLowFreqOn' between 0.1 Hz and 1 Hz.

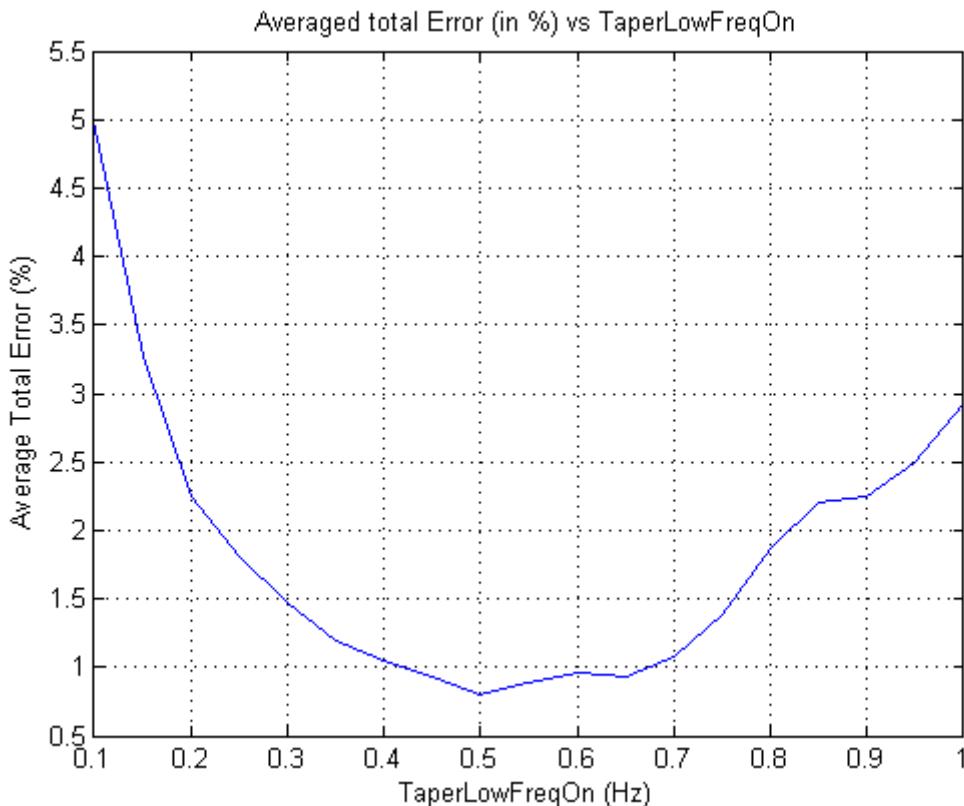


Figure 12 - Averaged total error in % vs TaperLowFreqOn

Finally, based on results shown at previous sections and specially on **¡Error! No se encuentra el origen de la referencia.**, it is proposed to set the value of parameter 'TaperLowFreqOn' to 0.5 Hz, and as a consequence, the value of 'TaperLowFreqOff' to 0.45 Hz.

So, proposed taper definition parameters for all SCNLs are:

- TaperLowFreqOff: 0.45 Hz
- TaperLowFreqOff: 0.5 Hz
- TaperLowFreqOff: 90% of Nyquist frequency
- TaperLowFreqOff: Nyquist frequency

## Appendix 9. *Clipping limits*

According with information provided station's owner, configured clipping values for each SCNL are shown on Table 20.

<b>SCNL</b>	<b>OWNER</b>	<b>Clipping value (counts)</b>
CA.ARBS.HHE	IEA	8.388.608
CA.ARBS.HHN	IEA	8.388.608
CA.ARBS.HHZ	IEA	8.388.608
FR.ATE.HHE.00	OMP	8.388.608
FR.ATE.HHN.00	OMP	8.388.608
FR.ATE.HHZ.00	OMP	8.388.608
CA.AVIN.HNE	IGC	8.388.608
CA.AVIN.HNN	IGC	8.388.608
CA.AVIN.HNZ	IGC	8.388.608
CA.CARA.HHE	IGC	8.388.608
CA.CARA.HHN	IGC	8.388.608
CA.CARA.HHZ	IGC	8.388.608
CA.CAVN.HHE	IGC	8.388.608
CA.CAVN.HHN	IGC	8.388.608
CA.CAVN.HHZ	IGC	8.388.608
CA.CBEU.HHE	IGC	8.388.608
CA.CBEU.HHN	IGC	8.388.608
CA.CBEU.HHZ	IGC	8.388.608
CA.CBRU.HHE	IGC	8.388.608
CA.CBRU.HHN	IGC	8.388.608
CA.CBRU.HHZ	IGC	8.388.608
CA.CCAS.HHE	IGC	8.388.608
CA.CCAS.HHN	IGC	8.388.608
CA.CCAS.HHZ	IGC	8.388.608
CA.CELS.HNE	IGC	8.388.608
CA.CELS.HNN	IGC	8.388.608
CA.CELS.HNZ	IGC	8.388.608
CA.CFON.HHE	IGC	8.388.608
CA.CFON.HHN	IGC	8.388.608
CA.CFON.HHZ	IGC	8.388.608
CA.CLLI.HHE	IGC	8.388.608
CA.CLLI.HHN	IGC	8.388.608
CA.CLLI.HHZ	IGC	8.388.608
CA.CEST.HHE	IGC	8.388.608
CA.CEST.HHE	IGC	8.388.608
CA.CEST.HHE	IGC	8.388.608
CA.CORG.HHE	IGC	8.388.608
CA.CORG.HHN	IGC	8.388.608
CA.CORG.HHZ	IGC	8.388.608
CA.CORI.HHE	IGC	8.388.608
CA.CORI.HHN	IGC	8.388.608
CA.CORI.HHZ	IGC	8.388.608
CA.CPAL.HHE	IGC	8.388.608
CA.CPAL.HHN	IGC	8.388.608
CA.CPAL.HHZ	IGC	8.388.608
CA.CSOR.HHE	IGC	8.388.608
CA.CSOR.HHN	IGC	8.388.608
CA.CSOR.HHZ	IGC	8.388.608
CA.CTRE.HHE	IGC	8.388.608
CA.CTRE.HHN	IGC	8.388.608
CA.CTRE.HHZ	IGC	8.388.608
ES.EALK.HHE	IGN	8.388.608
ES.EALK.HHN	IGN	8.388.608

<b>SCNL</b>	<b>OWNER</b>	<b>Clipping value (counts)</b>
ES.EALK.HHZ	IGN	8.388.608
ES.EARA.HHE	IGN	8.388.608
ES.EARA.HHN	IGN	8.388.608
ES.EARA.HHZ	IGN	8.388.608
ES.EJON.HHE	IGN	8.388.608
ES.EJON.HHN	IGN	8.388.608
ES.EJON.HHZ	IGN	8.388.608
ES.EORO.HHE	IGN	8.388.608
ES.EORO.HHN	IGN	8.388.608
ES.EORO.HHZ	IGN	8.388.608
FR.FESP.HNE	BRGM	8.388.608
FR.FESP.HNN	BRGM	8.388.608
FR.FESP.HNZ	BRGM	8.388.608
FR.FMON.HNE	BRGM	8.388.608
FR.FMON.HNN	BRGM	8.388.608
FR.FMON.HNZ	BRGM	8.388.608
FR.FNEB.HNE	BRGM	8.388.608
FR.FNEB.HNN	BRGM	8.388.608
FR.FNEB.HNZ	BRGM	8.388.608
CA.GIRR.HNE	IGN	8.388.608
CA.GIRR.HNN	IGN	8.388.608
CA.GIRR.HNZ	IGN	8.388.608
CA.GIRS.HNE	IGC	8.388.608
CA.GIRS.HNN	IGC	8.388.608
CA.GIRS.HNZ	IGC	8.388.608
CA.GRAM.HNE	IGC	8.388.608
CA.GRAM.HNN	IGC	8.388.608
CA.GRAM.HNZ	IGC	8.388.608
CA.LLIS.HNE	IGC	8.388.608
CA.LLIS.HNN	IGC	8.388.608
CA.LLIS.HNZ	IGC	8.388.608
FR.MLS.HHE.00	OMP	2.147.483.648
FR.MLS.HHN.00	OMP	2.147.483.648
FR.MLS.HHZ.00	OMP	2.147.483.648
CA.OLOS.HHE	IGN	8.388.608
CA.OLOS.HHN	IGN	8.388.608
CA.OLOS.HHZ	IGN	8.388.608
RA.PYAD.HNE.00	OMP	8.388.608
RA.PYAD.HNN.00	OMP	8.388.608
RA.PYAD.HNZ.00	OMP	8.388.608
RA.PYAS.HNE.00	BRGM	8.388.608
RA.PYAS.HNN.00	BRGM	8.388.608
RA.PYAS.HNZ.00	BRGM	8.388.608
RA.PYBA.HNE.00	BRGM	8.388.608
RA.PYBA.HNN.00	BRGM	8.388.608
RA.PYBA.HNZ.00	BRGM	8.388.608
RA.PYBB.HNE.00	OMP	8.388.608
RA.PYBB.HNN.00	OMP	8.388.608
RA.PYBB.HNZ.00	OMP	8.388.608
RA.PYFO.HNE.00	BRGM	8.388.608
RA.PYFO.HNN.00	BRGM	8.388.608
RA.PYFO.HNZ.00	BRGM	8.388.608
RA.PYHE.HNE.00	BRGM	8.388.608
RA.PYHE.HNN.00	BRGM	8.388.608
RA.PYHE.HNZ.00	BRGM	8.388.608
RA.PYLI.HNE.00	BRGM	8.388.608
RA.PYLI.HNN.00	BRGM	8.388.608
RA.PYLI.HNZ.00	BRGM	8.388.608
FR.PYLO.HHE.00	OMP	8.388.608
FR.PYLO.HHN.00	OMP	8.388.608
FR.PYLO.HHZ.00	OMP	8.388.608

<b>SCNL</b>	<b>OWNER</b>	<b>Clipping value (counts)</b>
RA.PYLS.HNE.00	BRGM	8.388.608
RA.PYLS.HNN.00	BRGM	8.388.608
RA.PYLS.HNZ.00	BRGM	8.388.608
RA.PYLU.HNE.00	OMP	8.388.608
RA.PYLU.HNN.00	OMP	8.388.608
RA.PYLU.HNZ.00	OMP	8.388.608
RA.PYPD.HNE.00	OMP	8.388.608
RA.PYPD.HNN.00	OMP	8.388.608
RA.PYPD.HNZ.00	OMP	8.388.608
RA.PYPM.HNE.00	BRGM	8.388.608
RA.PYPM.HNN.00	BRGM	8.388.608
RA.PYPM.HNZ.00	BRGM	8.388.608
RA.PYPP.HNE.00	OMP	8.388.608
RA.PYPP.HNN.00	OMP	8.388.608
RA.PYPP.HNZ.00	OMP	8.388.608
FR.SJAF.HHE.00	OMP	8.388.608
FR.SJAF.HHN.00	OMP	8.388.608
FR.SJAF.HHZ.00	OMP	8.388.608
FR.TERF.HHE.00	OMP	8.388.608
FR.TERF.HHN.00	OMP	8.388.608
FR.TERF.HHZ.00	OMP	8.388.608
FR.URDF.HHE.00	OMP	8.388.608
FR.URDF.HHN.00	OMP	8.388.608
FR.URDF.HHZ.00	OMP	8.388.608
CA.VIES.HNE	IGC	8.388.608
CA.VIES.HNN	IGC	8.388.608
CA.VIES.HNZ	IGC	8.388.608
ES.YARA.HHE	IGN	8.388.608
ES.YARA.HHN	IGN	8.388.608
ES.YARA.HHZ	IGN	8.388.608
ES.YSOS.HHE	IGN	8.388.608
ES.YSOS.HHN	IGN	8.388.608
ES.YSOS.HHZ	IGN	8.388.608

**Table 20 - Clipping values for each configured SCNL**

## Appendix 10. ***Results review***

### **Review 1: June 2012**

During a first test period of 2 months, 2 events with MI>3.0 have been detected inside SISPyr region with following hypocentral location (from IGN):

#### **Event1:**

Latitude: 41.56°  
Longitude: 2.71°  
Magnitude: 3.3 MI  
Depth: 10 km  
Origin time (UTC): 21:17:34.00  
Date: 2012/04/11

#### **Event2:**

Latitude: 42.37°  
Longitude: 1.12°  
Magnitude: 3.1 MI  
Depth: 10 km  
Origin time (UTC): 08:29:11.00  
Date: 2012/02/22

From the results of processing these both events some conclusions can be obtained regarding first system settings, and these are:

- Results obtained from DARACOM are very close to the values obtained by seismologist from IGC. Only minor differences have been detected, except in the case of PSA30, as shown on Figure 13 - Number of channels per %error range, all events
- 
- Some stations with good SNR have not been processed by DARACOM reporting a low SNR. It is because errors on event location give a bad estimation of theoretical P and S arrivals and it cause a shift on windows considered to compute SNR.

The impact of this shift on the noise computation window cause to compute the signal as noise, reducing the computed SNR; and it affects mainly to those stations with short epicentral distances.

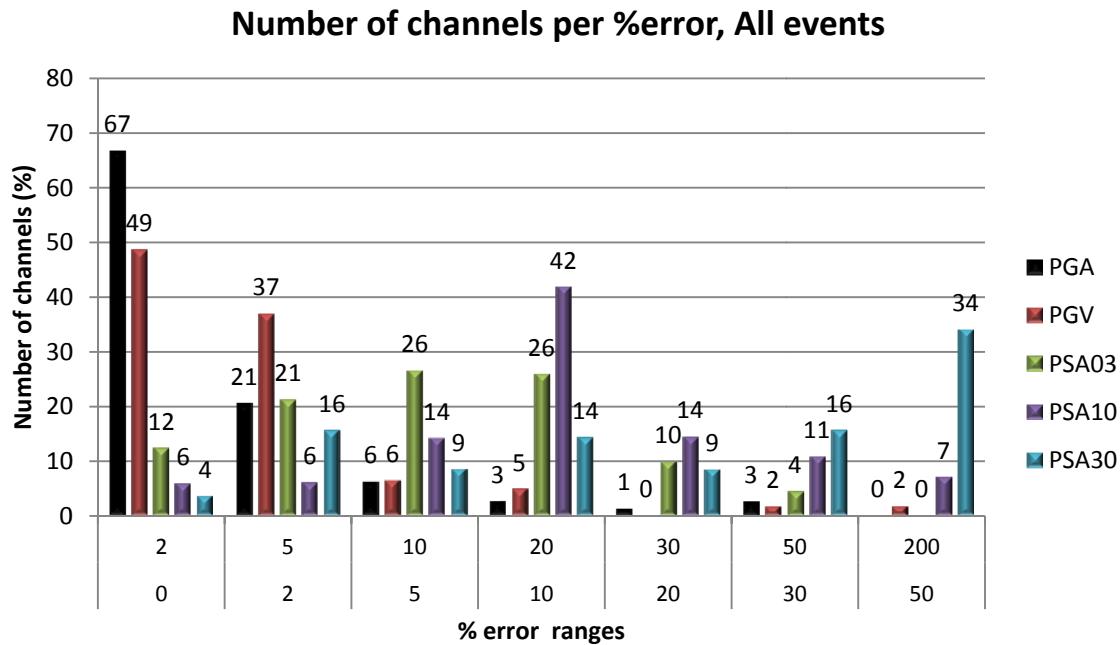


Figure 13 - Number of channels per %error range, all events

To prevent and solve unwanted behaviours describe before, following improvements and updates on setting have been carried out:

- A new version of DARACOM has been produced (version DARACOM201206) with the following improvement:
  - o Time window to compute noise to obtain SNR of each trace starts at first value of *traceTimes* parameter and finish at  $2^*T$  seconds before the theoretical P arrival time, instead at P arrival time; where  $T$  corresponds to the second value of *SearchWindow* parameter.

This update allows some shift on the P arrival time estimation avoiding computing signal as noise.
- *traceTimes* parameter have been updated from [5; 60] to [15; 60].
- *SearchWindow* parameter has been updated from [0; 2; 0; 30] to [0; 4; 0; 15].