IGETS business meeting

Convener: Hartmut Wziontek
Wed, 26 Apr, 17:30–19:00 / Room 2.83

Status of Permanent Components

- Stations: Short reports?
- Analysis Centers:
  - Level 2 products: ICET / University of Polynesia, Tahiti, French Polynesia
  - Level 3 products: EOST Strasbourg, France
- Data Center:
  - ISDC of GFZ Potsdam, Germany - Report by Christian Voigt

Products

- **Level 1:** Raw data provided by station operator
  - standard: 1 min (repair code 00)
  - extra: → 1 sec data
- **Level 2:** based on Level 1
  - ICET/UFP
  - User supplied corrected files: uncalibrated?

→ IAG-services: comparison/combination of solutions of different AC's

- **Level 3:** based on Level 2
  - Tidal model
  - Atmosphere, hydrology, polar motion

Individual corrections provided to the user!

GGP-IGETS STATION REPAIR CODES
updated from
http://www.eas.slu.edu/GGP/repaircodes.html
Feb 17, 2017

Code	Level	significance	
00	1	raw data (as recorded), decimated to 1 min	no repair prior to decimation (GGP STANDARD). short gaps or spikes shorter than about 10 sec can be filled by linear interpolation between good data points on the raw data (full signal), prior to decimation.
00	1	raw data as recorded at 1 sec, 2 sec ..	no repair, file extension "ggs",
01	1	gaps and disturbances filled with synthetic signal	repair done on raw data, before decimation to 1 min, suggested maximum gap length 2 days
02	1	as 01 + offsets adjusted	repair done on raw data, before decimation to 1 min
11	2	gaps and disturbances filled with synthetic signal	repair done by station operator on data after decimation to 1 min
12	2	as 11 + offsets adjusted	repair done by **station operator** on data after decimation to 1 min
21	2	gaps and disturbances filled with synthetic signal	repair done by staff at **ICET***, on data after decimation to 1 min, prior to tidal analysis
22	2	as 21 + offsets adjusted	repair done by staff at **ICET***, on data after decimation to 1 min, prior to tidal analysis
h1	2	data processed by **user**	one hour data decimated from 1 min
h2	2	data processed by **ICET***	as above, but done by staff at **ICET***

L3-Products - how to distinguish IGETS from GGP

(derived from contribution by David C. March 23, 2017)

a) Minimal service:

- the 1 hr fully corrected yearly files.
- based on corrected minute files,
- corrections:
  - tides
  - polar motion,
  - atmospheric loading (local and non-local)
  - global hydrology loading
- linear trend correction for station (e.g. a linear function removed).
- intermediate files connected with the processing not provided

b) Intermediate files available:

- corrected 1 minute '12' files
- hourly residuals with tide and local pressure (and polar motion?) removed
- default loading: atmosphere + non-local hydrology, for a selected set of models for all stations, e.g. GLDAS+MOG2D
- instrumental drift correction

c) Full service:

- a) and b)
- tidal model for each station computed from the hourly '22' files, produced by ICET, and the
- calibration files already accepted by IGETS.

L3-Products

Proposal by Jean-Paul:

- Tidal model
  - Short period constituents:
    Local model from analysis
  - Long-period constituents:
    DDW99 + ocean tide model, most likely FES2014
- Atmosphere:
  - EOST Loading Service, based on ECMWF
  - Atmacs
- Global Hydrology
- [Oceanic non-tidal loading]
- Polar motion
- Not only residuals, but also all applied models are provided separately

Issues:

- Quality of L2 data, frequent gaps reported
- Discrepancy in scale factor?
  Tidal model of ICET must be known to use L2 data!
- Correction of time delay?
  Atmospheric pressure: no delay
  gravity: delay between 45 and 8 sec (iGrav shorter), to be considered in analysis!
- Atmacs: Oceans only IB, to be combined with EOST oceanic loading (e.g. MOG2D)
- Drift: Instrumental drift, by AG link to AGrav or direct data exchange for IGETS stations;
- Linear trends can be removed by user

Proposals

- Quality check of Level 2 data:
  Assessment of differences to pre-processing results by station operators of for a period
- Data submission: GWR registration system collects data on a daily basis. iGrav registration only provides daily 1 second data (all in one file)
  → Daily Submission to IGETS database and automatic aggregation to monthly files?
- Adding pre-processed (corrected) data as additional channel after the original data (VP)
- Account for scale factor and time delay in tidal modeling: Either document scale factor and time delay together with tidal model or provide tidal corrections in Volts.

Offsets, Calibration and Gravity Correction Function

- Calibration File: Not provided yet by any user?
  - Scale factor
  - Time delay

  Documentation of any changes / new / best estimates
- Documentation of offset corrections:
  - B. Ducarme: ***jumplist*** file
  - Alternative: simple table

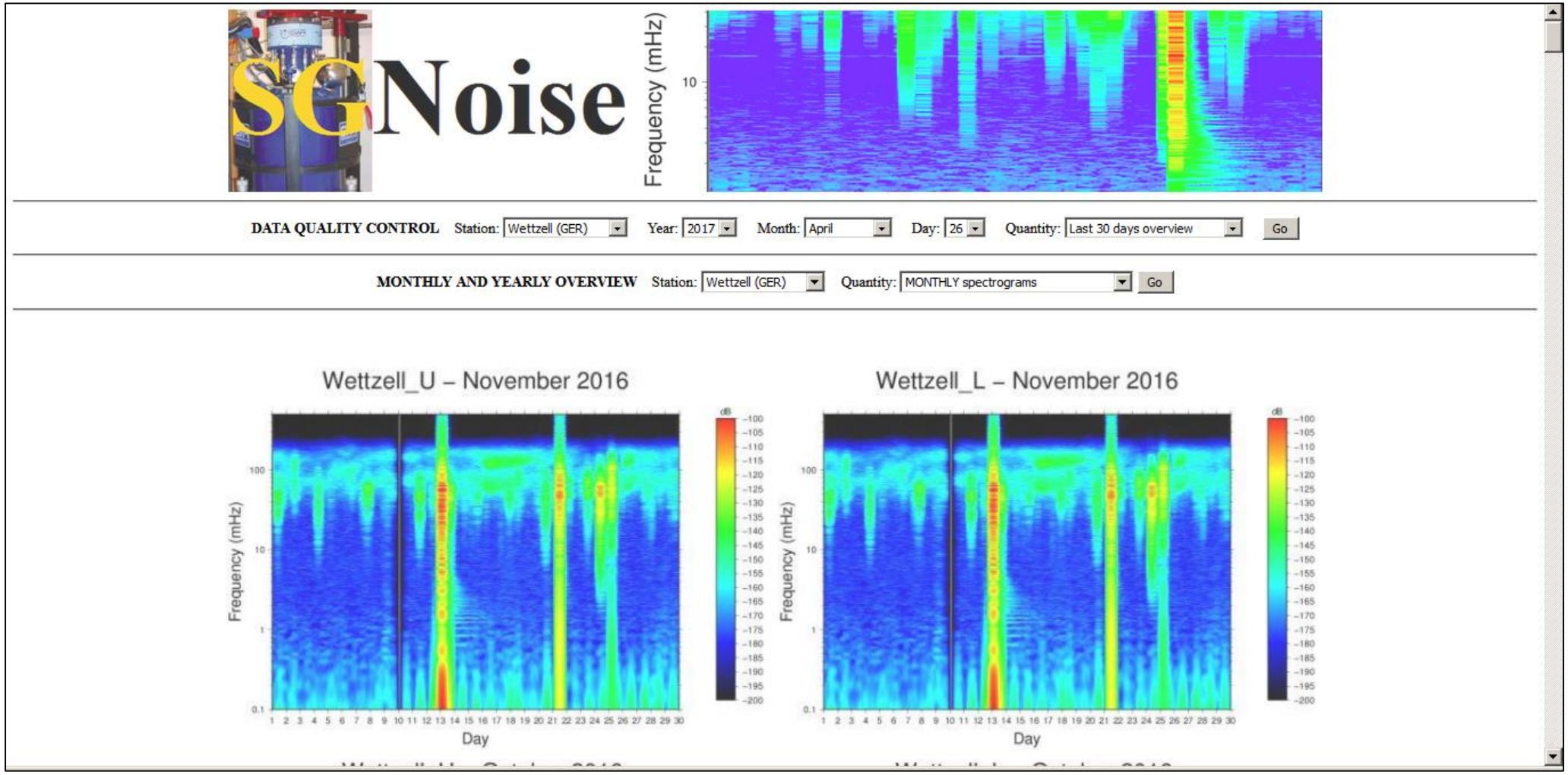
  Important to be documented, scale factor dependent!
- Gravity Correction Function
  - Tides, Atmosphere, Polar motion etc. → residuals
  - Tides from analysis depend on calibration!
    Significant tidal residuals after change of calibration parameters (scale and time delay)
    → Tidal corrections scaled back? (B. Ducarme)
- How to apply time delay?
  - Record not stationary without correction
  - Loss of coherence with local air pressure record

```
Filename            : IGETS-SG-CAL-ap046-20160900.cal
Station             : Apache Point, New Mexico, USA
Instrument          : GWR OSG 046
Author              : Tom Murphy (tmurphy@physics.ucsd.edu)
each line gives the date and any updated value such as gcal, pcal, the time lag,
their standard deviations and 'applied since' date. the format is (a8,6f10.3,5x,a8)
yyyymmdd gcal(nm/s^2/V); std; pcal(hPa/V); std;   time lag(s); std;   applied since
C*******************************************************************************
20110801  -793.28      0.041     1.000     0.001     1.540     0.010     20110801
99999999
20131120  -940.18      0.121
20140910  -939.97      0.084
20140910  -940.04      0.069     1.000     0.001     1.540     0.010     20131120
20141205                                             1.320     0.015
20141205  -940.04      0.069     1.000     0.001     1.320     0.015     20141205
.....
99999999
```

Start	End	Step	Uncertainty		Comment
2007 02 27 11 25 20	2007 02 27 11 29 00	9.93	0	#	
2007 05 09 07 55 00	2007 05 14 21 49 00	7.90	1	#	Eichung/Abbau Eichplattform
2007 05 21 13 48 00	2007 05 24 20 08 00	-5.00	1	#	Gradientenmessung
2007 05 30 11 24 00	2007 06 04 17 16 00	15.70	1	#	Anbau Eichplattform/Eichung
		18.60			
2007 05 09 08 27 00	2007 05 14 21 52 00	7.50	1	#	Anbau Eichplattform/Eichung
2007 05 21 13 49 00	2007 05 24 20 06 00	-4.61	1	#	Gradientenmessung
2007 05 30 11 24 00	2007 06 04 17 15 00	-18.01	1	#	Eichung/Abbau Eichplattform
		-15.12			
2008 02 21 10 55 10	2008 02 21 12 37 30	-9.66	0	#	Gewichte auf Stativ??
2009 09 16 17 17 30	2009 09 16 17 17 40	-54.20	2	#	Warburton, Arbeiten an GEP
					New Remote card and UIPC
2010 05 31 12 56 20	2010 05 31 12 57 10	-119.12	1	#	2.50
2010 06 02 06 29 40	2010 06 03 05 10 40	-1225.00	2	#	Stromausfall
2010 09 02 06 06 30	2010 09 03 06 12 00	18.89	2	#	
2012 11 29 07 04 50	2012 11 29 07 05 10	-1.18	0	#	Fahrzeug Ankunft

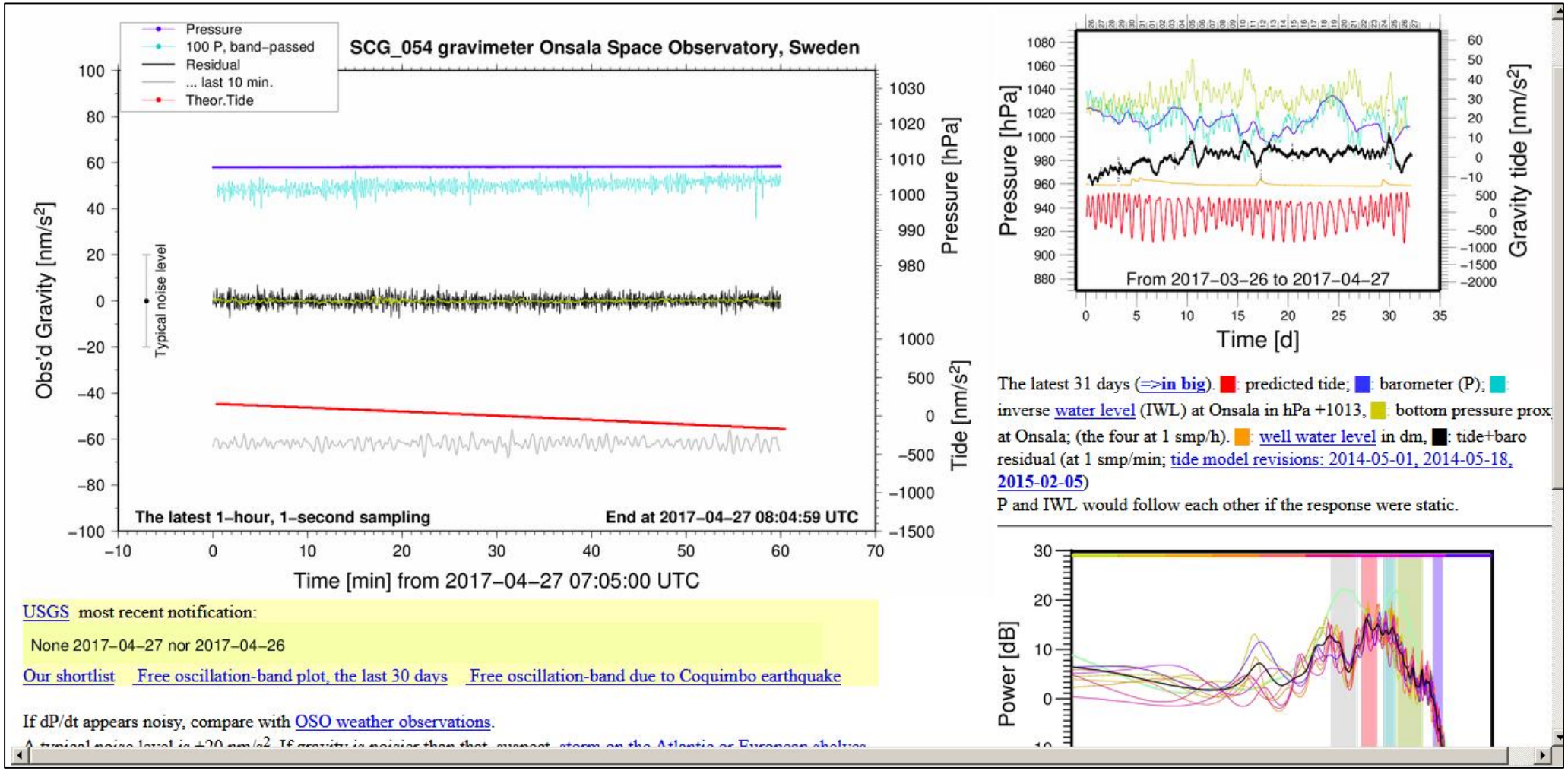
Realtime analysis of SG data

http://oko.pecny.cz/grav/



Realtime analysis of SG data as part of ther Service?

http://holt.oso.chalmers.se/hgs/SCG/monitor-plot.html

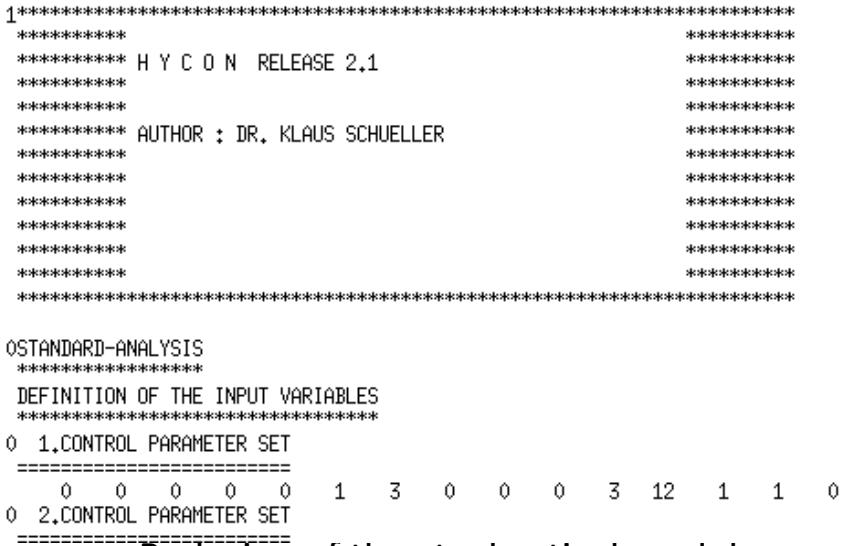


Updated Version of ETERNA ET34-ANA-V60

- No update of Eterna 3.4 package since 1997, DOS binaries not executable on Windows 7+
- Initiative by K. Schüller (HYCON) in 2014 welcome:
  Updated version with new features based on source code of version 3.4

New Features (selected):

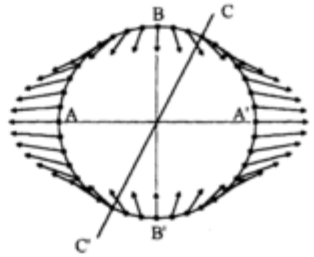
- Hypothesis free modelling of the higher degree of the tidal force development (TGP V3-V6)
- Integrating the DDW-H and DDW-NHi Earth models in addition to WDZ up to degree 6
- Fully integrating degree 1 tidal potential.



- Redesign of the stochastical model now fully based on least squares and statistical theory
- Binaries 32- and 64-bit MS-Windows compatible with Vista, 7, 8, 10, based on FTN95 from Silverfrost

ETERNA – Earth Tide Analysis and... | Advanced Calibration Method...

http://ggp.bkg.bund.de/eterna/



HOME NEWS ABOUT

The enhanced Earth Tide Analysis and Prediction Program ET34-ANA-Vmn

Introductory remarks by

Klaus Schueller, Research Initiative for Tidal Analysis (RITA)

The objective of this initiative is to acknowledge and preserve the extraordinary intellectual and technical work of my colleague and friend Prof. Dr.-Ing. habil. Hans-Georg (Schorsch) Wenzel who passed away a long time ago.
Therefore, the intention is to maintain and enhance a comprehensive and sustainable platform for Earth tide analysis which will meet the nowadays requirements of the tidal user community all over the world.

Search

Search

News

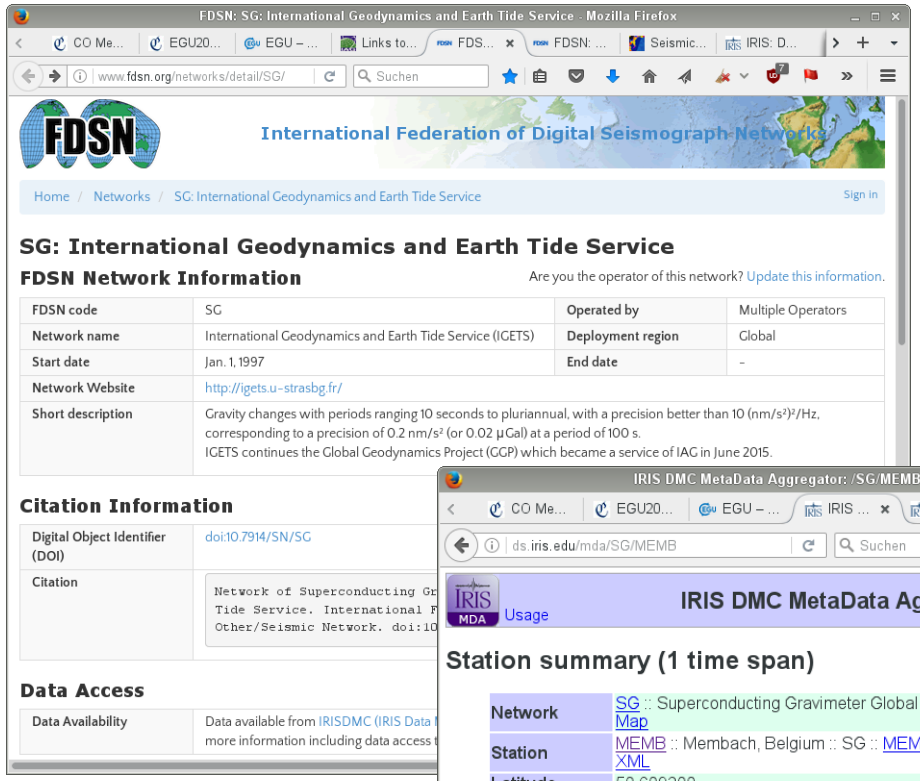
Maintenance update for ET-ANA-V52 available!

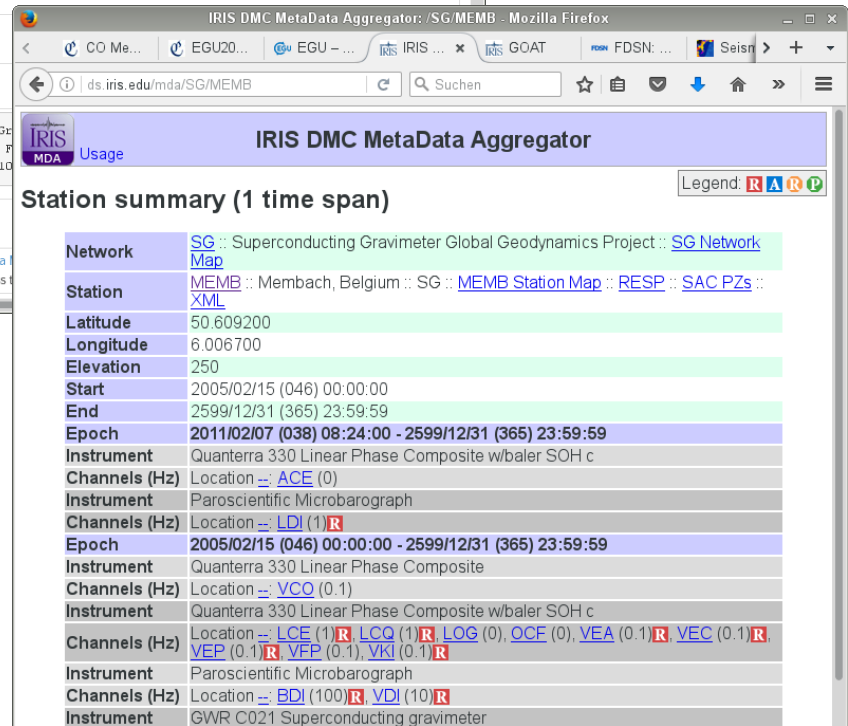
Coming soon: Version ET34-ANA-V60

Download of Version ET34-ANA-V52 avail-

IRIS (Incorporated Research Institutions for Seismology)
FDSN (International Federation of Digital Seismograph Networks)

- Only three stations:
  MEMB (high rate), ST, YS (not active)
- Correction of FDSN entry for network SG requested
- Conversion to MiniSEED?
- Transfer function: How to derive poles/zeros? Nominal values of analogue filter?
- Simple way to provide 1s-Daten?





Documentation

- Filter characteristics:
  - Tide
  - GGP-filters,
  - iGrav/iOSG
- Numerical filters at the old GGP website?
- Should we set up a wiki?

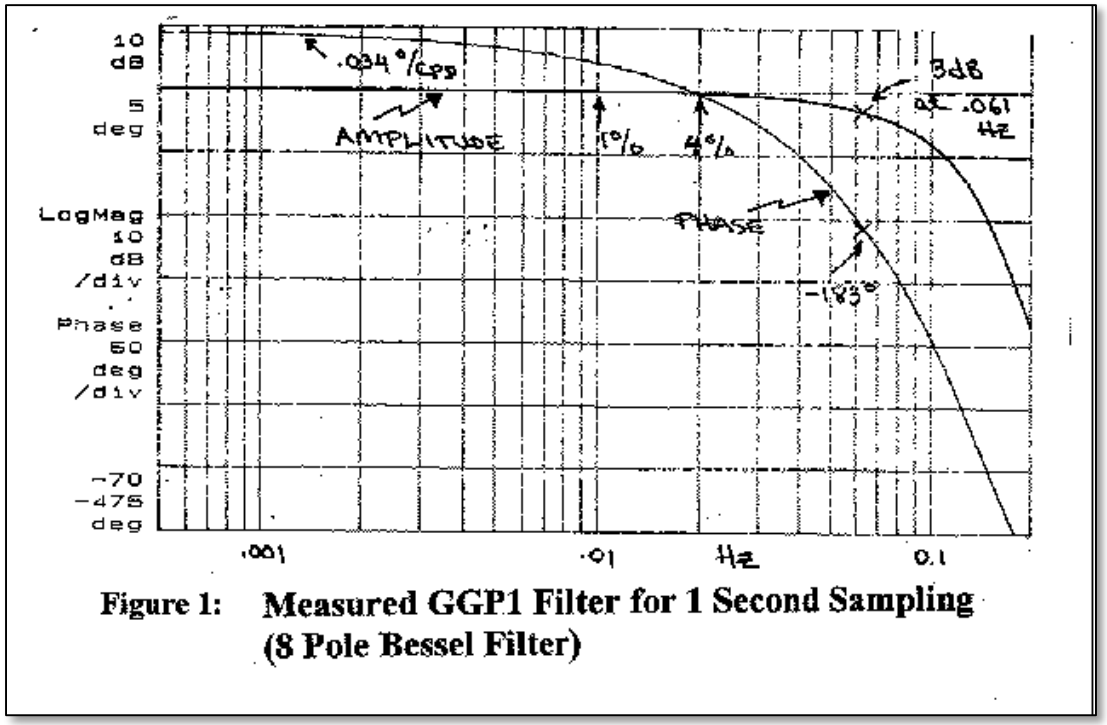
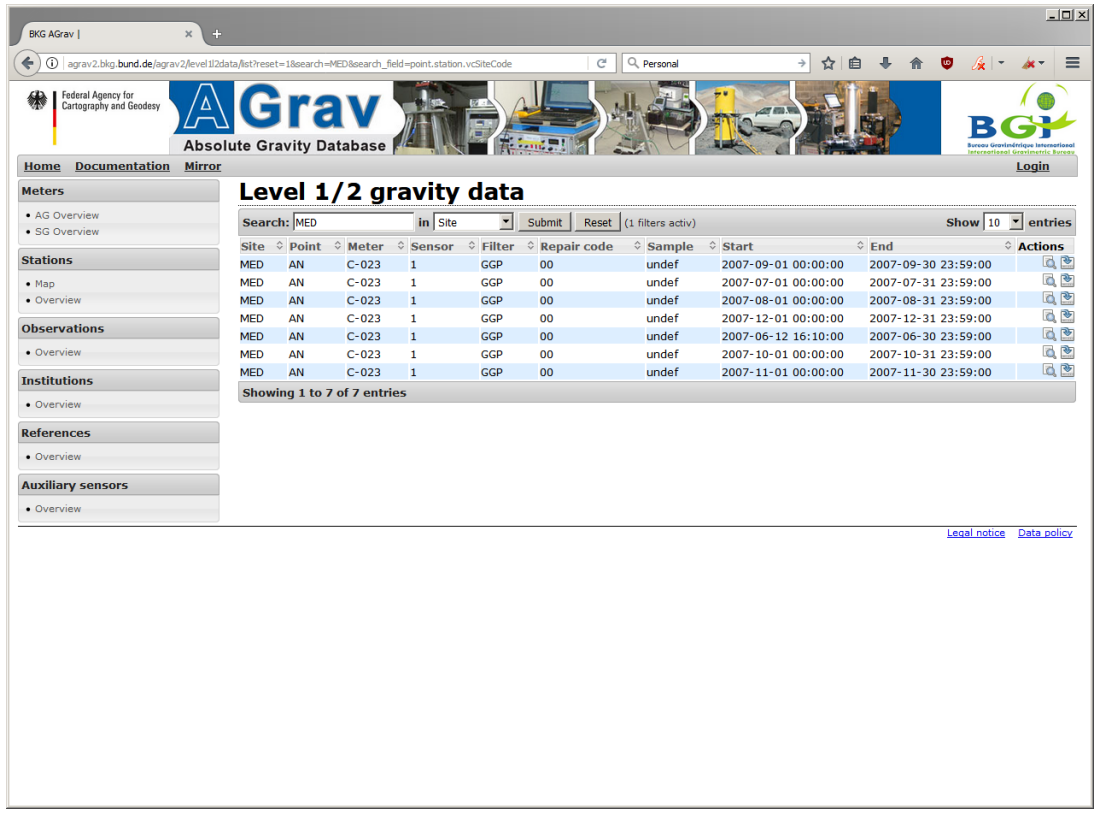


Figure 1: Measured GGP1 Filter for 1 Second Sampling (8 Pole Bessel Filter)

Link to AGrav

- IGETS-database file based, ftp-server
- Web-interface of AGrav currently under major revision
- Experimental new version had link to GGP:
  - Montly files added to AG-station
  - List of SG, split into sensor and filter
  - Time series (GGP-files) linked to the used filter
  - Sensor/filter with specific properties, like scale factor and time delay → calibration file
- Actual development may include a ‘view’ on IGETS (SG) data by linking files on ftp-server at GFZ

Preview of the experimental AGrav database (2. Gen.)



Logo

- Tidal bulge: Earth tides
- Earth Interior and Core: Geodynamics
- Colors in agreement with IAG

Many thanks to Christian for the proposal!

Update of IAG web page (logo missing there)

Next meeting

- IAG-IASPEI meeting at Kobe?
- Re-establishing data flow from Japanese stations?
- How to get connected to new iGrav operators?
- Providing Level 3 data (residuals) will be big benefit for non-tidal community!