ICET DATA BASE (May 31, 2015)

(Status Report)

It has been decided to present the tidal data stored in the ICET in a uniform way after a careful check of the series.

The data base is organised in directories corresponding to the different stations ordered by station number SSSS following the ICET list of stations (Figure).

In each station directory there is a subdirectory for each instrument IIII operated at the station. The name of the subdirectory is CIIISSSS, where C corresponds to the corresponding tidal component: gravity, tilt, strain….

Different files can be found in the subdirectory with specific qualifiers i.e.

- OUT: raw uncalibrated data in ETERNA format,
- TIT: description of station and instrument,
- V66: old analysis performed with Venedikov (VEN66) analysis method,
- PRN: old analysis performed with ETERNA34 analysis method,
- CAL: calibration table (if any),
- MIN: filtered values for VEN66 input, including interpolated calibrations,
- DA1: data calibrated using *.CAL calibration table,
- DA2: data calibrated using the interpolated calibration table in *.MIN,
- INI: input file with parameters for ETERNA34 analysis method,
- ANA: new analysis performed with ETERNA34 analysis method (.AN1 obtained with DA1 and *AN2 obtained with DA2).

The information is summarized in the *.DAT file which is duplicated in the root directory.

When a same instrument was used at different epochs in the same station with different settings, it is not always possible to provide unified data sets. The files corresponding to the different data sets are discriminated by changing the qualifier of the file names in the following way:OUA and OUB, DA1 and DB1, DA2 and DB2, DAT and DBT, ANA and ANB, …. Some files such as *.TIT are often shared.

Applications of the new ICET data base

The main goal of the new data base is indeed to save the wealth of tidal records gathered during 50 years at ICET. These data are well documented and could be used for further investigations using new methods. The user which is not interested by the different steps of the transformation can safely use the CIIISSSS.DAT files located in the root directory of the station SSSS to perform new analyses.

For a full exploitation of the tidal analysis results it is necessary to compute the different tidal vectors from the tidal analysis results. These vectors should be compared with the solid Earth tidal response and the ocean tides loading.

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All information for the instrument II1, held in subdirectory CII1SSS1 is summarized in one single file CII1SSS1.dat located in the root directory SSS1.

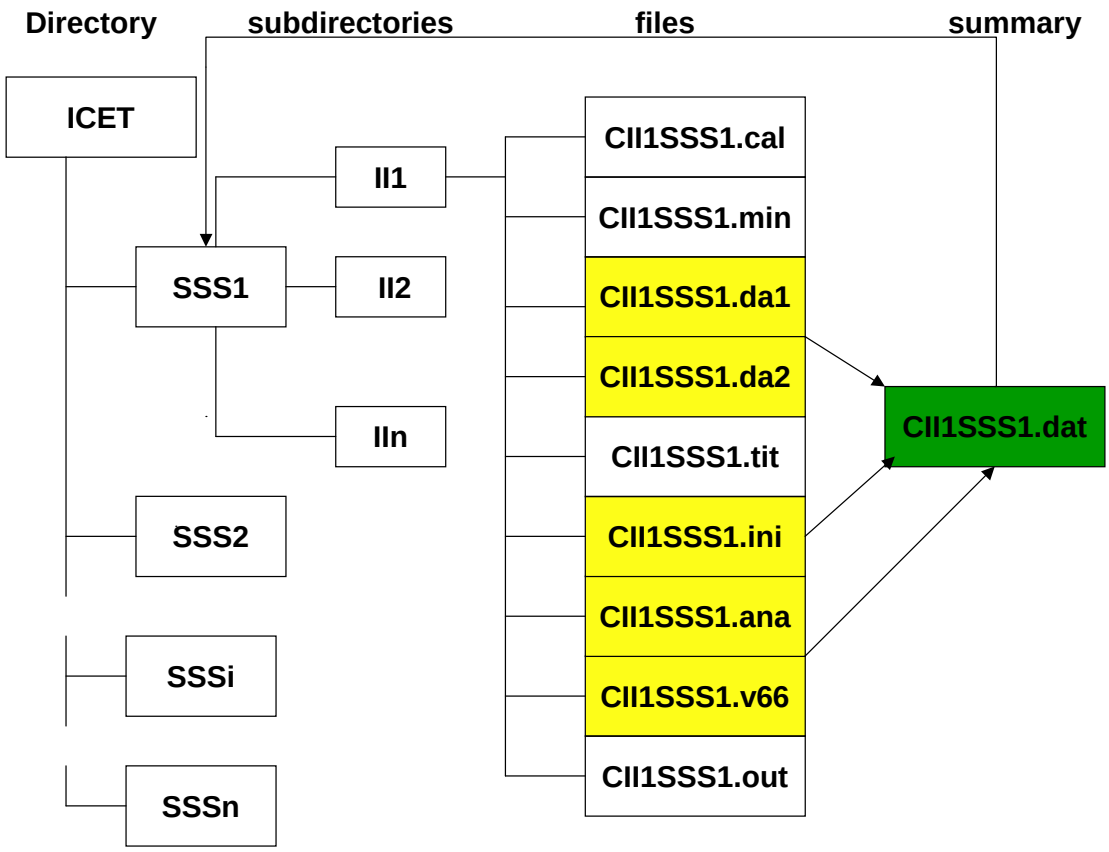

Figure: Information available in the new ICET data bank for a given station SSS1.

Status of the Global Geodynamics Program (GGP) data processing at ICET

2011-2015

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INTRODUCTION

The Global Geodynamics Program (GGP) raw minute data (GGP-SG-MIN) are preprocessed and validated at ICET in order to provide reliable hourly data sets for tidal analysis. In a first step, gaps and spikes in the monthly raw data files are corrected using the T-soft software. The corrected minute data (GGP-SG-CORMIN) are then uploaded on the Information System and Data Center (ISDC at isdc.gdz-postdam.de) with repair codes 12 or 22. The corrected minute data are decimated to one hour sampling and submitted to tidal analysis. The hourly data are also uploaded as one-year blocks (GGP-SG-HOUR, code h2) on the same site. We summarize the current status of our processing for all the GGP stations between 2011 and 2015.

We summarize in Table 1 the preprocessing and analysis work performed at ICET in the framework of the Global Geodynamics Program (GGP). Several stations are no more operating: BA, BE, BO, BR, KY, MA, PO, SY, VI. Other ones did not provide recently data on a regular basis: CO, MB and the stations depending from the Japanese computing center (CB, KA, NY), who did no more send data since 2013. Since last year most of the stations have been updated until end of 2014 (in red in the Table 1). It corresponds to a total of 203 months of data. Since 2011 some 880 months of data from 20 superconducting gravimeters have been preprocessed.

The standard deviation STD computed with ETERNA (ANALYZE) is also given in Table 1. As the stability of the sensitivity of the superconducting gravimeters is better than 0.1%, the STD is a measure of the signal to noise ratio in the station. For 25 series the STD is lower than 1nm/s^2. When the STD is larger than 2nm/s^2 the data set is not suitable for a precise determination of the fine tidal spectrum.

It was found that the Tsoft filter of half-length 8 hours, sometimes used to decimate the minute data to hourly values, was too short. As a result a significant attenuation of the semi-diurnal waves was observed when an analysis based on hourly values was compared with the direct analysis of the original data sampled at one minute internal. The series marked with Y in the last column of Table 1 have been recomputed with a longer filter (24 hours) to suppress this effect. Several anomalies were found and corrected in the previous minute data.

In the framework of the new IGETS Service it has been decided to provide corrected minute data expressed in mV to allow easy modifications of the calibration when new or more accurate values become available. In the same time the corrections applied during the

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preprocessing will be documented. It is especially important for the step corrections which could spoil the long term gravity variations recorded by the instrument.

Table 1: Status of preprocessed and analyzed GGP data on May 2015
n: number of preprocessed months since last year
N: number of days effectively used in the global tidal analysis
STD: standard deviation of the global analysis (ETERNA)

Code	Location	SG Instr.	ICET Code	RAW	Corrected	n (months)	N (days)	STD (nm/s^2)	Hourly check
AP	Apache Point, USA	SG046	00466090	150200	150222	17	1695	1.169	Y
BA*	Bandung, Indonesia	T008	00084100	030600	030622		1104	2.938	
BE*	Brussels, Belgium	T003	07790200	000900	000901		¶6692	1.641	
BF	Black Forest, Germany	CD056_L CD056_H	01560716 02560716	130900 130900	130922 130922	15 15	1134 1136	0.611 0.670	Y
BH	Bad Homburg, Germany	(T001) CD030_L CD030_U SG044	 01300734 02300734 00440734	 070400 070400 150200	 070422* 070422* 150222	 16	¶1005 2222 2218 2886	0.950 0.783 0.835 0.610	 Y Y Y
BO*	Boulder, USA	C024	00246085	031000	031022		1850	1.109	
BR*	Brasimone, Italy	T015	00150515	991200	991222		1428	2.954	
CA	Cantley, Canada	T012	00126824	150300	150300	15	5472 ¶6634	1.421 1.390	Y
CB	Canberra, Australia	C031	00314204	130700	130722	22	5591	0.792	Y
CO	Conrad	(C025)	00250699				1877	0.565	Y
ES	Esashi, Japan	T007	00072849	081200	081222?	→200402 25	2274	1.491	
HS	Hsinchu, Taiwan	T048	00482695	120800	081222		898	2.249	
KA	Kamioka, Japan	T016	00162828	130700	130722	22	3006	1.229	Y
KY*	Kyoto, Japan	T009	00092823	030600	030622	→200207 31	1533	3.691	
MA*	Matsushiro, Japan	T011	00112834	080600	080622		3954	1.008	
MB	Membach, Belgium	C021	00210243	120900	111222	!	5907	0.705	Y
MC	Medicina, Italy	C023	00230506	150200	150222	13	6174	0900	Y
ME	Metsahovi, Finland	T020	00200892	131200	131222	14	5409 ¶5564	1.167 1.166	Y
MO	Moxa, Germany	CD034_L CD034_U	01340770 02340770	140200 140200	140222 140222	19 19	4841 4913	0.550 0.564	Y
NY	Ny Alesund,	C039	00390005	120100	120122		3776	2.687	

	Norway								
PE	Pecny,CZ	OSG050	00500930	141200	141222	17	2758	0.562	Y
PO*	Potsdam, Germany	T018	00180765	980900	980912		2250	0.856	
ST	Strasbourg, France	(T005) C026	 00260306	 150100	 150122	 25	¶3272 6134	2.265 0.633	 Y
SU	Sutherland, South Africa	CD037_L CD037_U SG052	01373806 02373806 00523806	141200 141200 141200	141222 141222 141222	12 12 12	3925 3748 2195	0.917 0.945 0.944	Y Y Y
SY	Syowa, Antarctic	T016	00169960	030100	030122*	→200012 31	1279	1.387	
TC	Tigo, Concepcion, Chile	RT038	00387621	141200	141222	14	3450	1.075	Y
VI*	Vienna, Austria	C025	00250698	061200	061222		3402 ¶4278	0.525 0.463	Y
WE	Wettzell, Germany	(SG103) CD029_L CD029_U CD030_L CD030_U	01030731 01290731 02290731 01300731 02300731	980900 101000 101000 150200 150200	980921* 101022* 101022* 150222 150222	 18 18	¶726 4264 4226 1665 1679	2.639 0.579 0.597 0.644 0.609	 Y Y Y Y
WU	Wuhan, China	T004	00322647	120700	120712•		3844	0.937	
					TOTAL	203			

* instrument stopped

? status unknown

• preprocessed by data owner

( ) not included in GGP

¶ with data before 1997/07

→ end of the global analysis