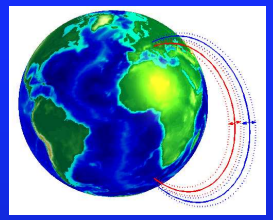
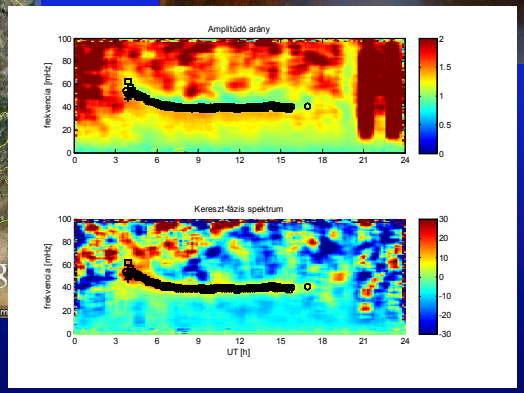
PLASMON WP2

report: year 2

Heilig Balázs, MFGI

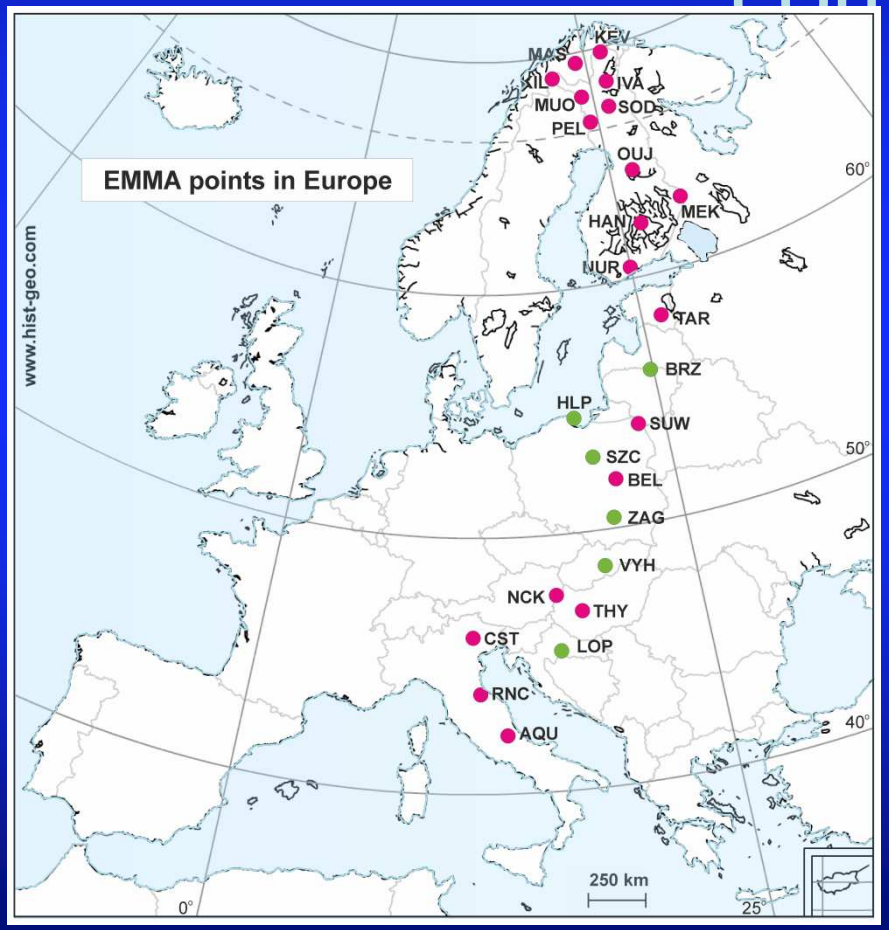


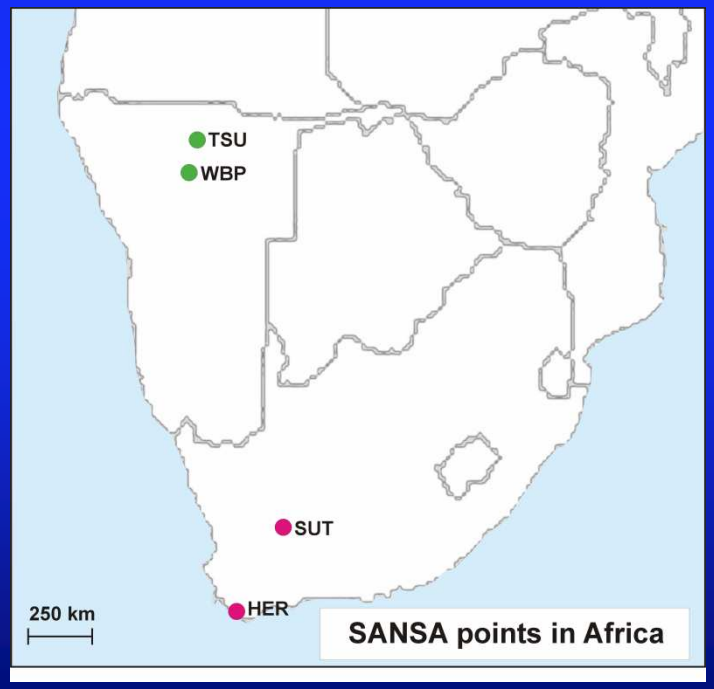


WP2

D2.2 EMMA and SANSA networks have been completed

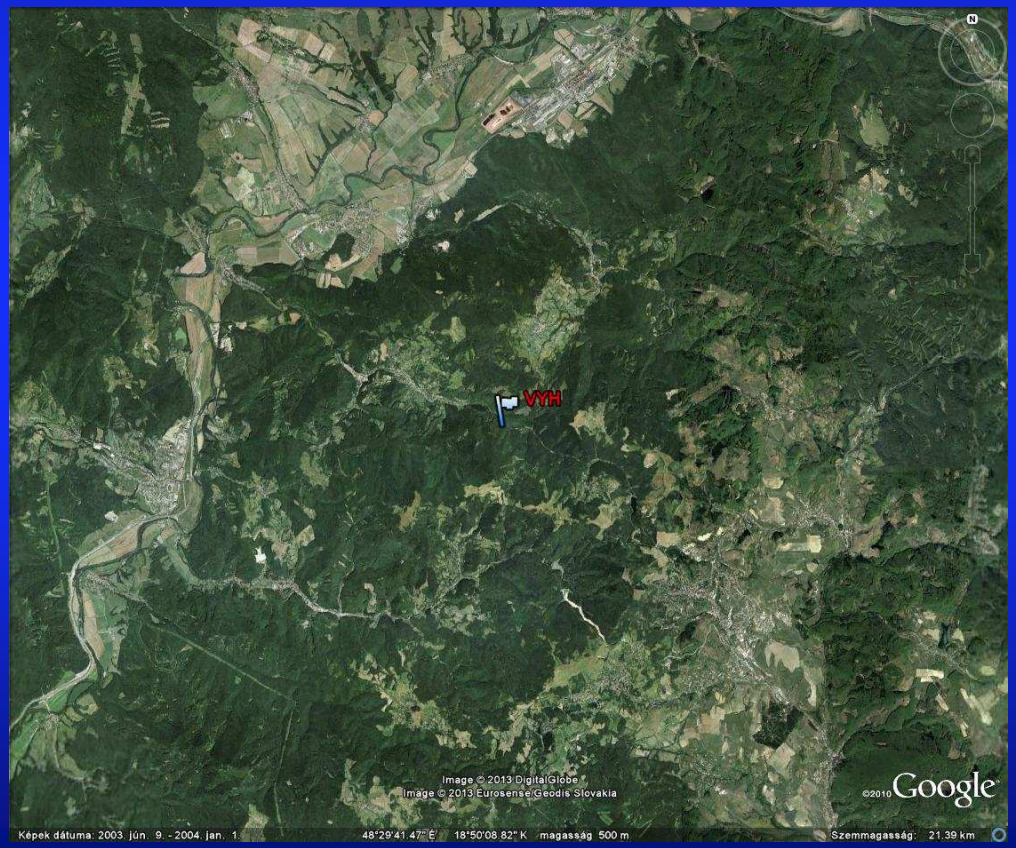
European quasi-Meridional Magnetometer Array





Installation of EMMA stations

- Vyhne (near Selmecbánya, Banska Stiavnica, Schemnitz



Installation of EMMA stations

- Vyhne: 2011.11.22 2012.07.25 2012.10.08
- In an old silver mine tunnel

Installation of EMMA stations

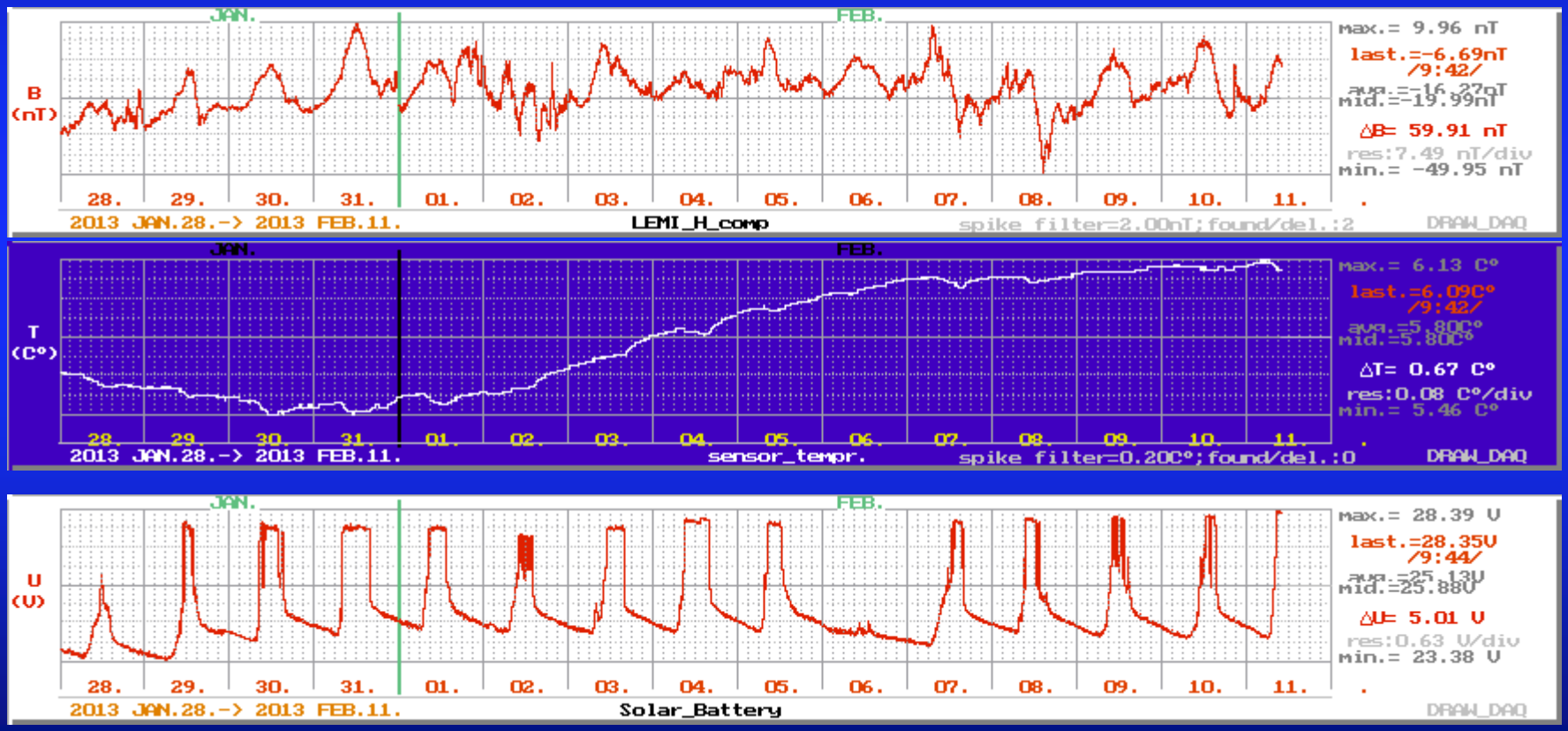
- Lonjsko Polje (near Sava river) 2012.12.13

Installation of EMMA stations

- Lonjsko Polje (near Sava river) 2012.12.13, 2012.12.29

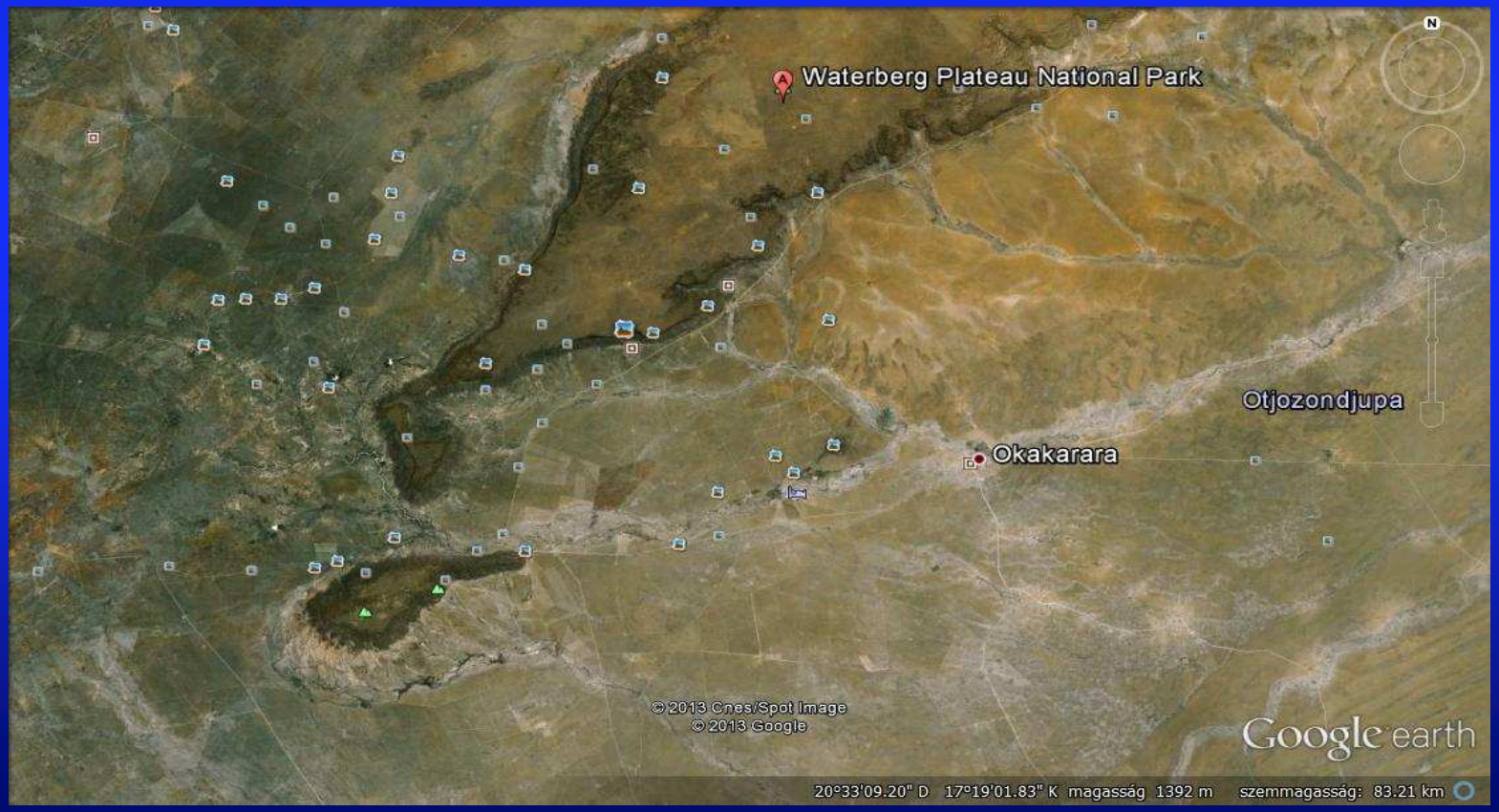
Installation of EMMA stations

- Web monitor for LOP (magnetic H, T of sensor, U of batteries)



Installation of SANSA stations

- Tsumeb (Namibia) 2012
- Waterberg Plateau National Park (Namibia) ~2013.01.30



Installation of SANSA stations

- Waterberg Plateau National Park (Namibia) ~2013.01.30

EMMA for PLASMON and Finnish Geophysical Observatory Geomagnetic pulsation data

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CSD spectra

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CSD spectra

Space Weather

Space Climate

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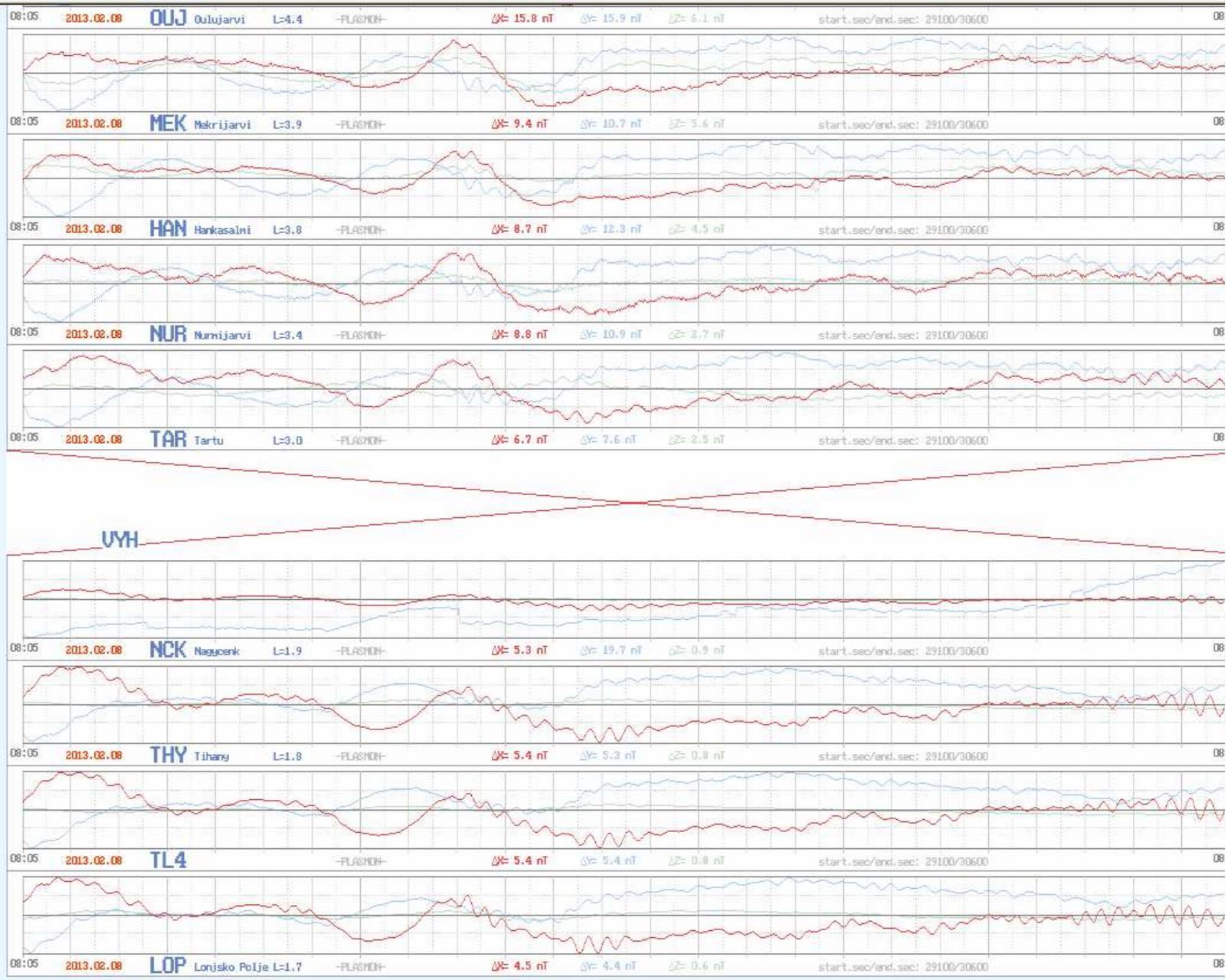
IHY2007
IHY CIP39
WHI campaign

Contact

Staff



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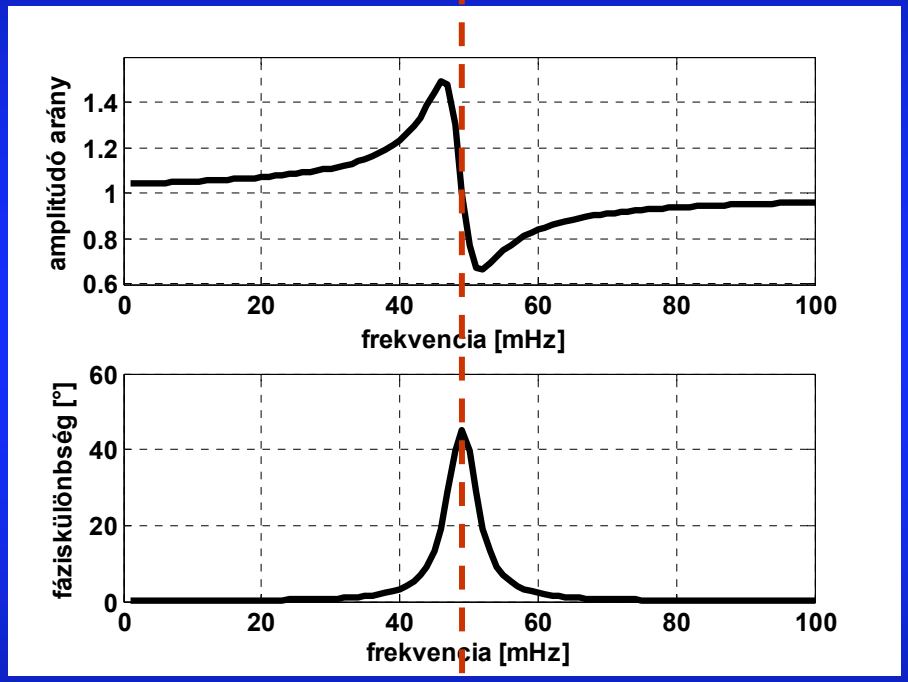
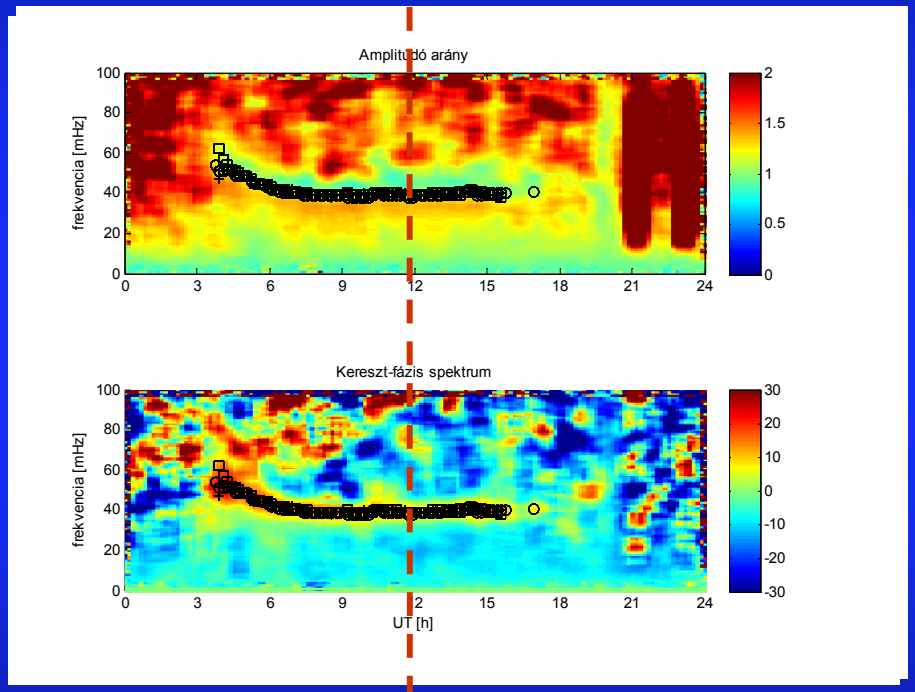
D2.3 FLRID

Computer algorithm of FLRID

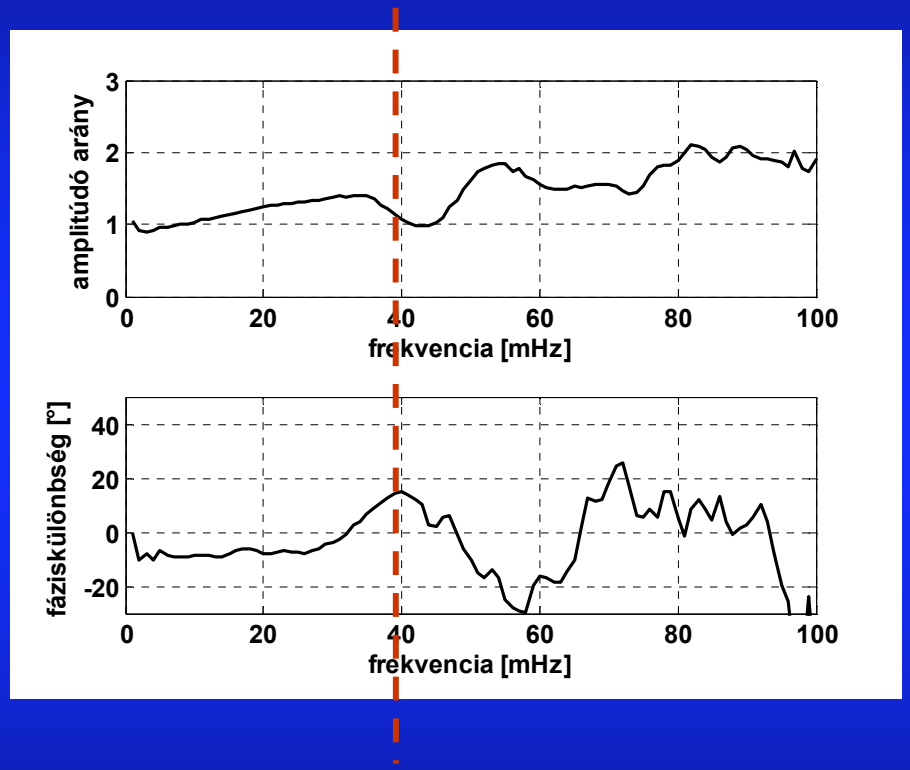
D2.3 FLRID: amplitude and phase gradient method

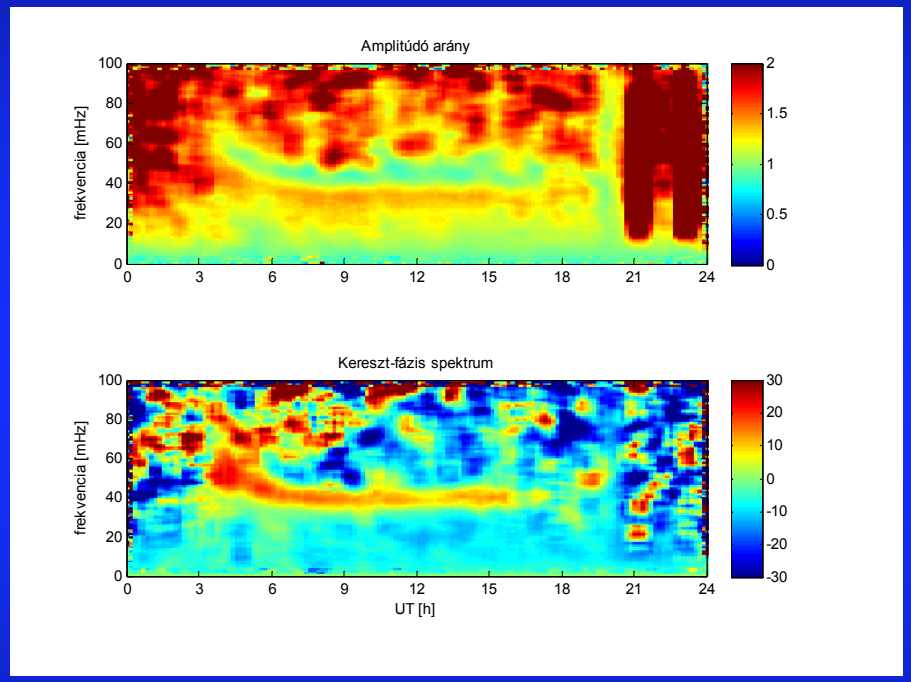




Could not work in real-time

D2.3 FLRID: amplitude and phase gradient method





~15 parameters (nfft, overlap, size of 2D smoothing window, thresholds for phase difference, power, expected amplitude ratio, etc...)

D2.3 FLRID

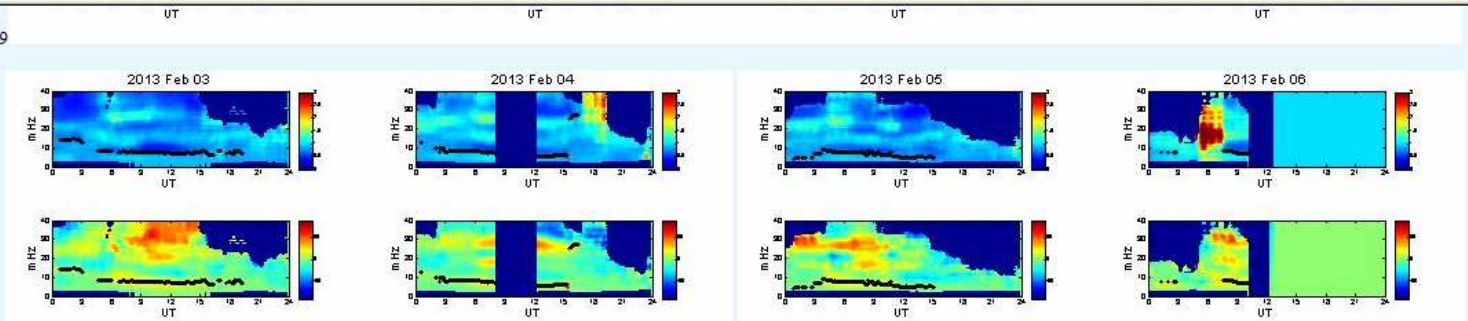
new feature:

- known time shifts (or to take into account the transfer function of the whole systems)

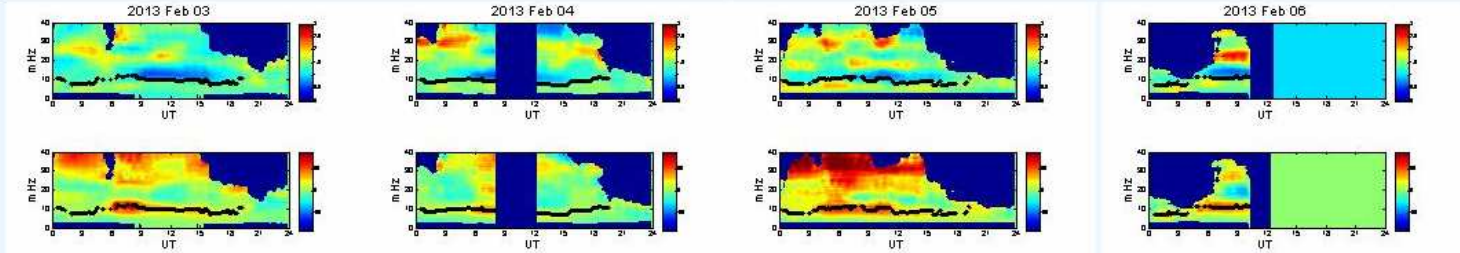
- possibility to correct for unknown timing error (estimated from cross-phase)

EMMA for PLASMON and Tihany Geophysical Observatory Geomagnetic pulsation data

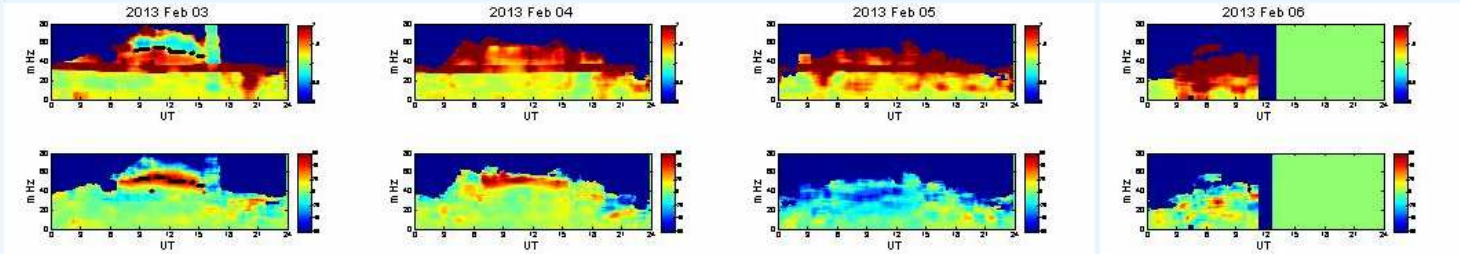
OUJ-HAN L=4.09



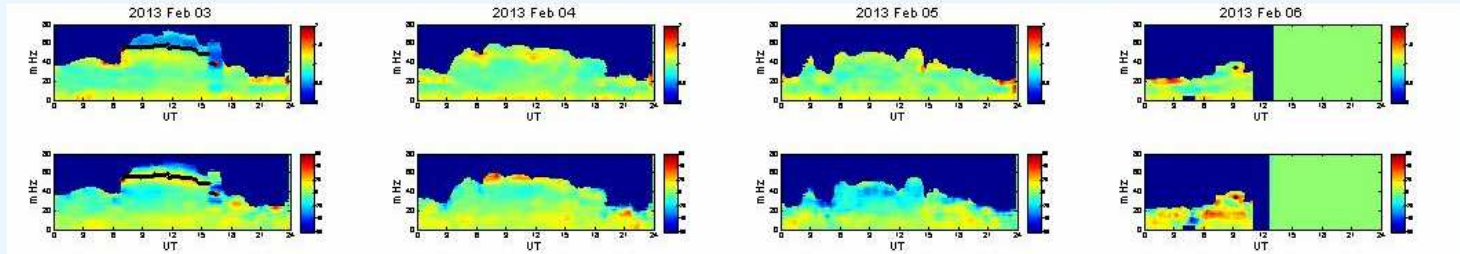
HAN-NUR L=3.62



NUR-TAR L=3.24



NCK-LOP L=1.81



THY-LOP L=1.78

Under development

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D2.4 EMMA & INTERMAGNET data standards

INTERMAGNET Definitive One-second Data Standard (DD20)

ongoing discussion (IAGA GA, workshops) IAGA workshop, San Fernando

General specifications

- Time-stamp accuracy 0.01s
- Phase response: Maximum group delay ±0.01s
- Maximum filter width 25 seconds
- Instrument amplitude range: 7±4000nT high Lat., 7±3000nT mid/equatorial Lat.
- Data resolution 1pT
- Pass band: DC to 0.2Hz

Pass Band Specifications [DC to 8mHz (120s)]

- Noise level: >100pT RMS
- Maximum offset error (cumulative error between absolute observations): ±2. 5 nT
- Maximum component scaling & linearity error: 1%
- Maximum component orthogonality error: 2mrad
- Maximum Z-component verticality error: 2mrad

Pass Band Specifications [8mHz (120s) to 0.2Hz]

- Noise level: >10pT/HHz @ 0.1 Hz
- Maximum gain/attenuation: 3 dB

Stop Band Specifications [7 0.5 Hz]

- Minimum attenuation in the stop band (7 0.5Hz): 50 dB

NEW EMMA stations fulfill INTERMAGNET standards (except for time stamp rules)

EMMA Data formats have been defined

Data transfer format (EMMA2013):

A: File name convention (L_SOD_2012_12_12_061500_01Hz_v1.bin)
B1: 7*16 byte header information:

Records	bytes	1st 4byte				2nd 4byte				3rd 4byte				4th 4byte			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1-16	Data format version (EMMA2013)								Source of data							
2	17-32	Station name												0	IAGA code		
3	33-48	Lat		Long		Elev		free		0	Ref. frame			0	Orientation		
4	49-64	Sampling rate		Data rate		version	Data type			Usage-flag=>***		nof.overwrote		nof.missing		free	
5	65-80	Filter definition fájl															
6	81-96	Instr. def. fájl															
7	97-112	s =>uint32 conv		nT=>int32 conv		year		month	day							Header-extension	
8	113-128	Time-in-day(uint32)				C1 (int32)				C2 (int32)				C3 (int32)			

- including time/components in ms/pT

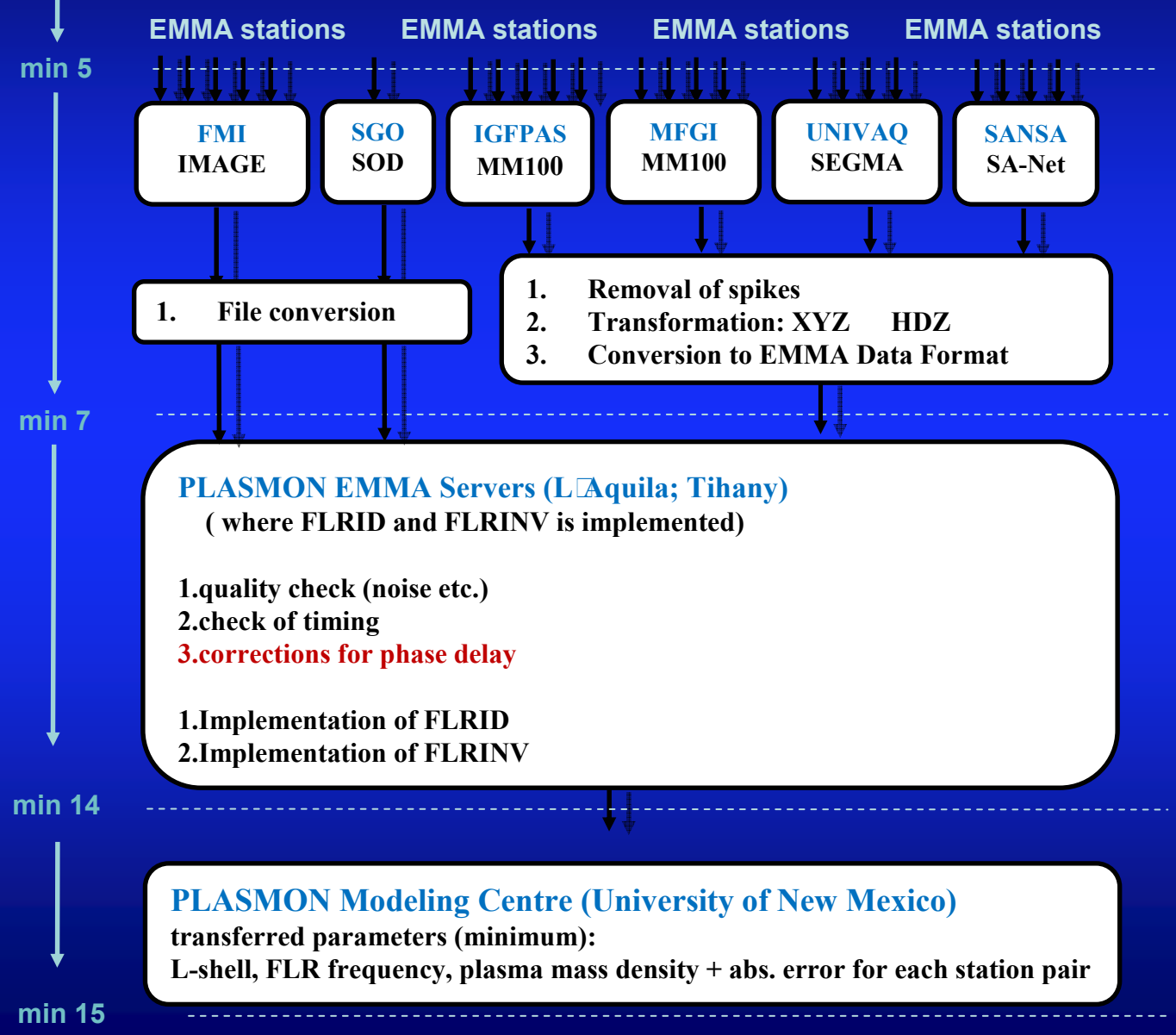
Size of a daily file: 1 382 512 byte

Data from local nodes to EMMA Servers should be transferred in this format. Documentation available.

Archive (external data exchange) format:

IAGA-2002 format, definition for 1 Hz data is available on IAGA's website

EMMA Data Flow Plan



EMMA monitor (test system)

Set up at Tihany

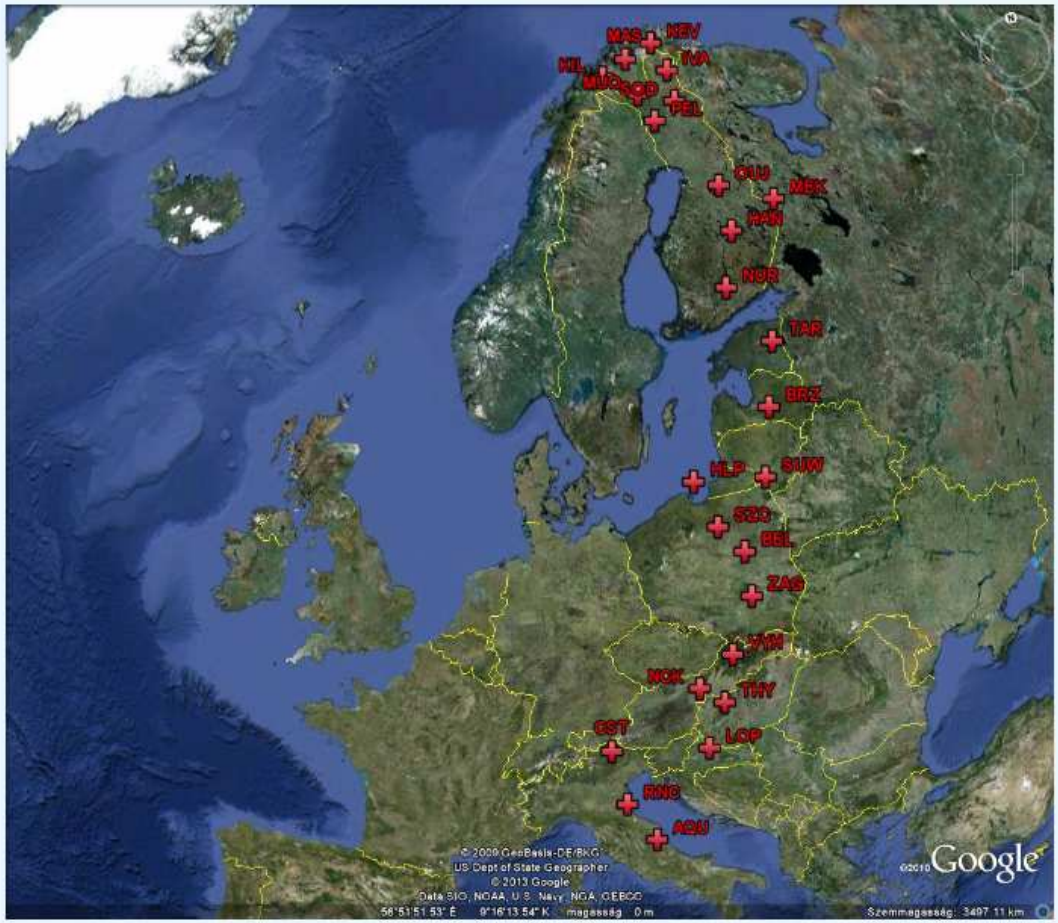
implements:

1. file conversions
2. some data quality check and de-spiking
3. correct for known time delays (able to estimate unknown time delay)
4. FLRID
5. web-monitor for EMMA and FLRID

FLRINV is set up at L'Aquila (two servers has not yet been connected)

EMMA for PLASMON and Tihany Geophysical Observatory Geomagnetic pulsation data

Map of EMMA stations



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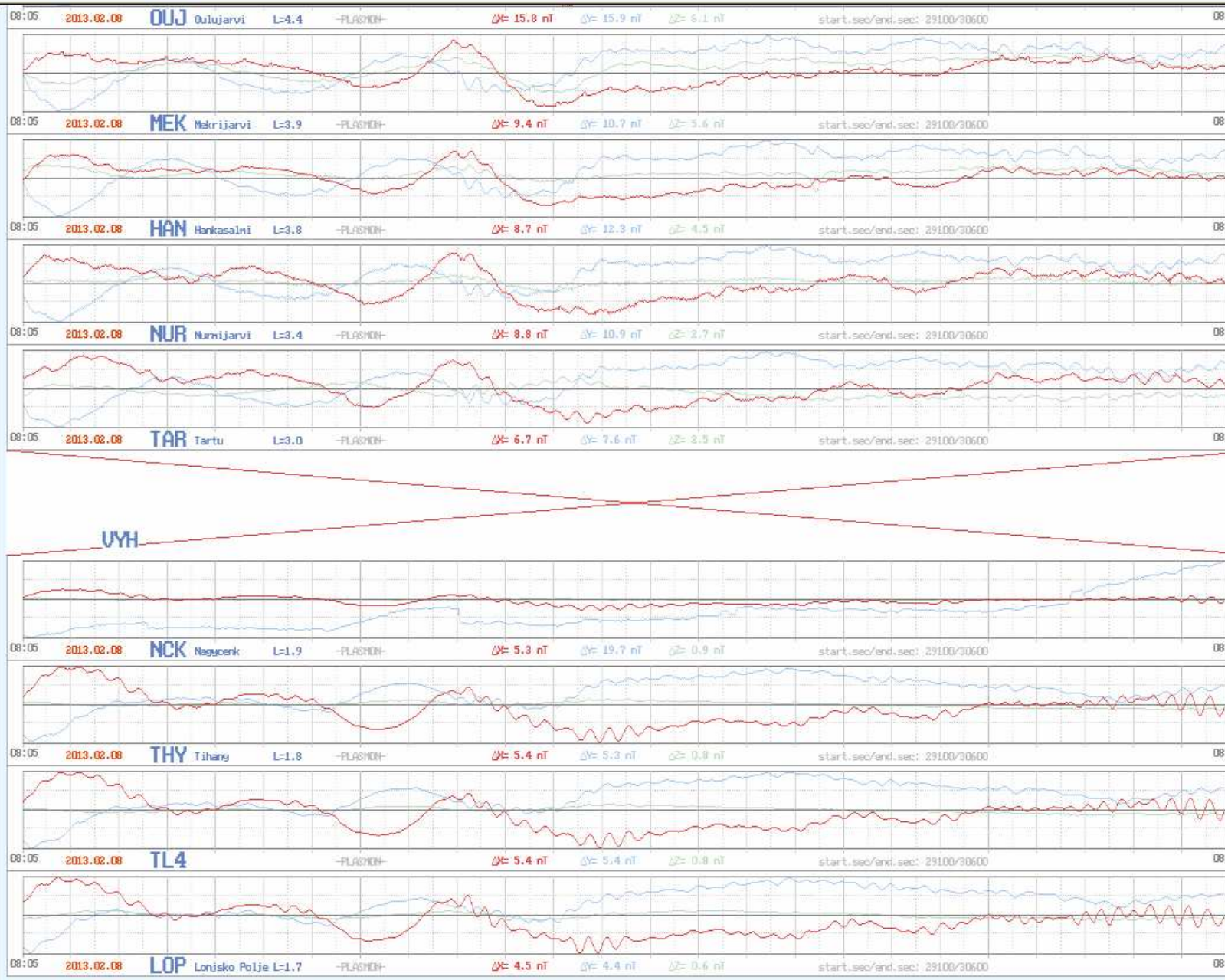

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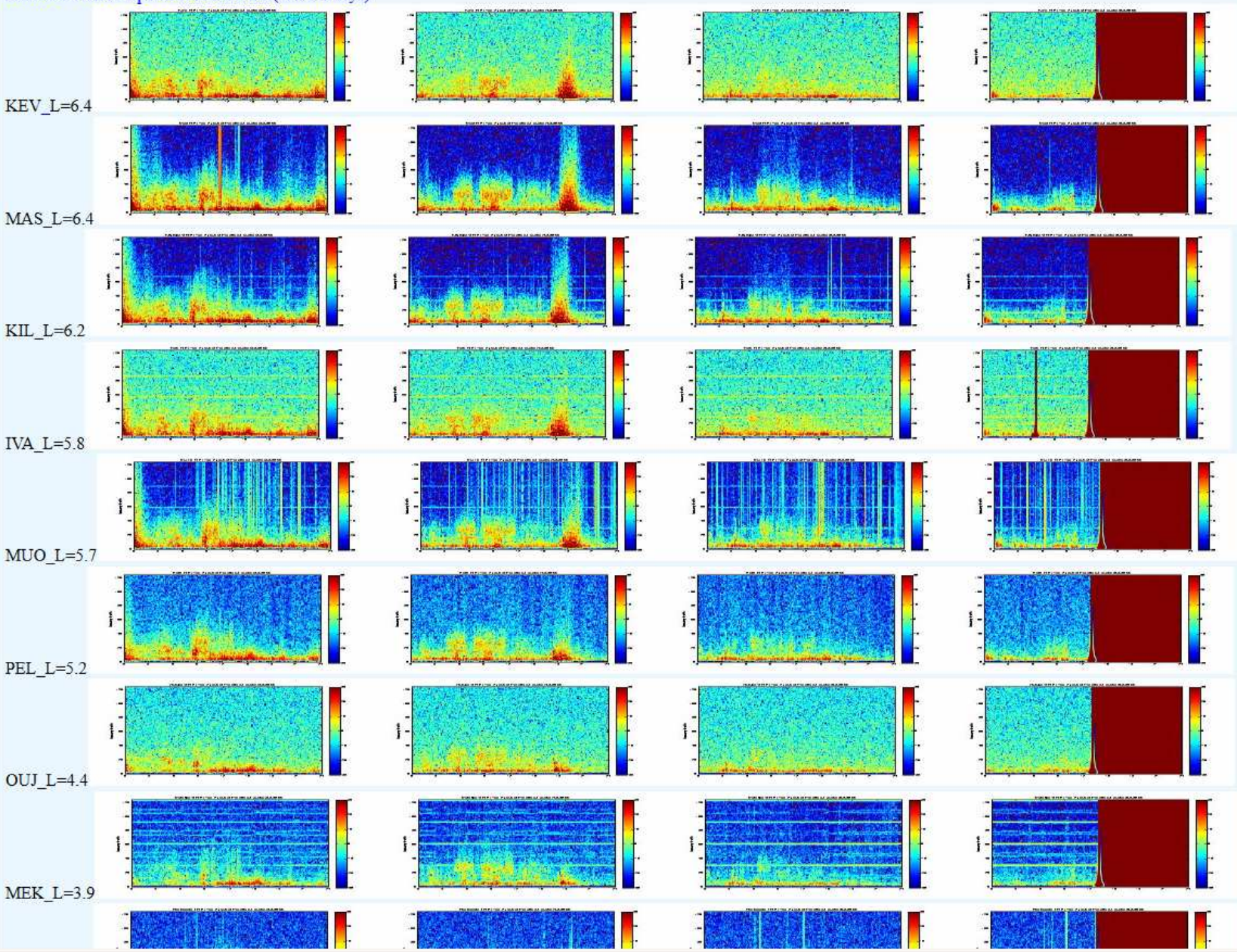
EMMA for PLASMON and Tihany Geophysical Observatory Geomagnetic pulsation data

EMMA Power Spectral Densities (latest 4 days)



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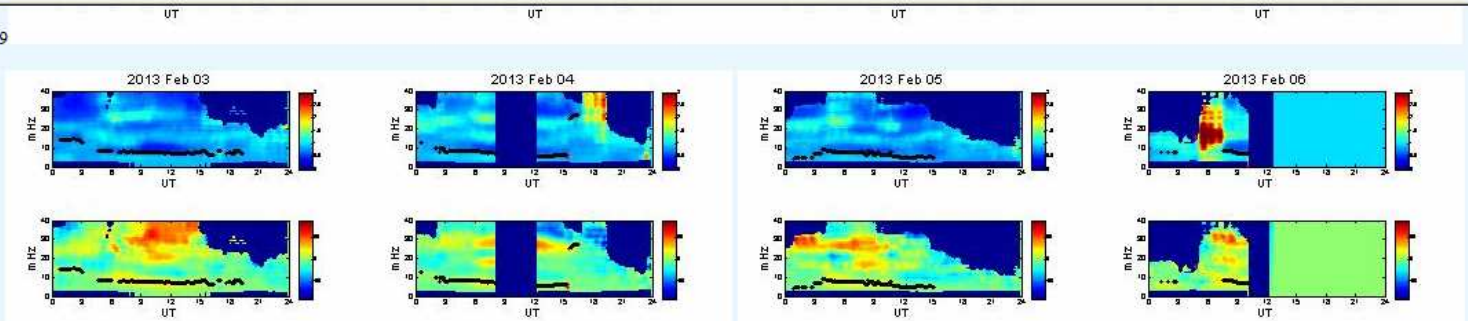

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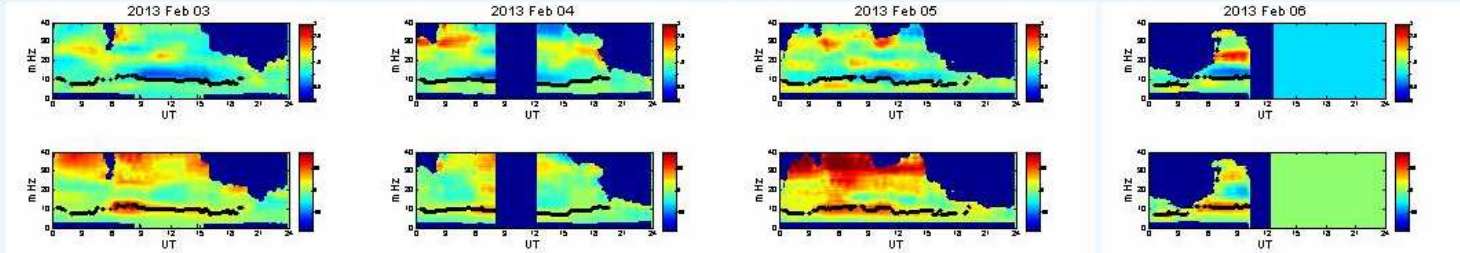

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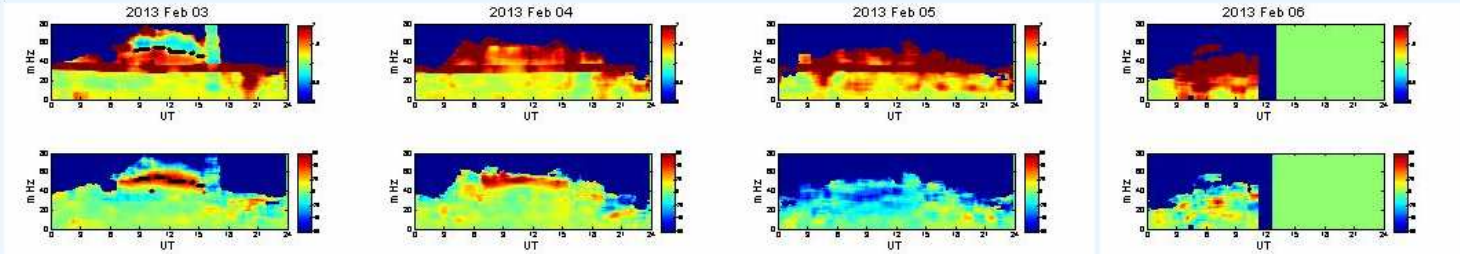

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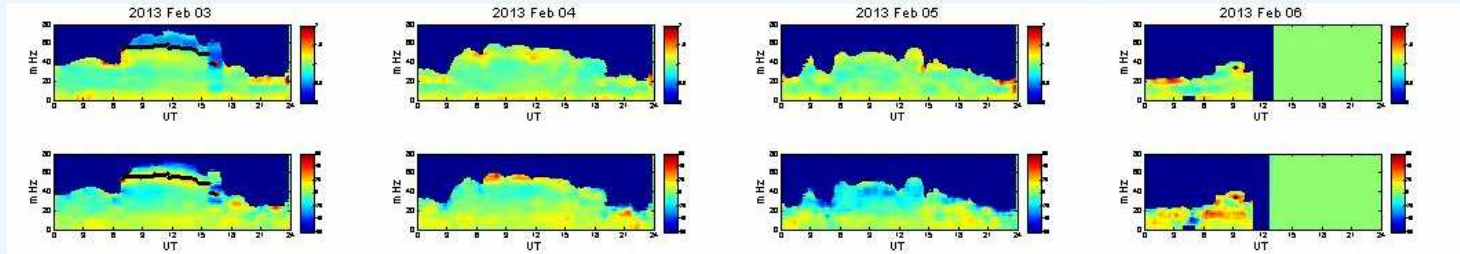

THY-LOP L=1.78

Under development

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Dissemination/Science

2 papers

- 1 on FLRs observed by CHAMP satellite (JGR),
- 1 on plasmapause observations of CHAMP (AnGeo)

Conferences.

END OF REPORT