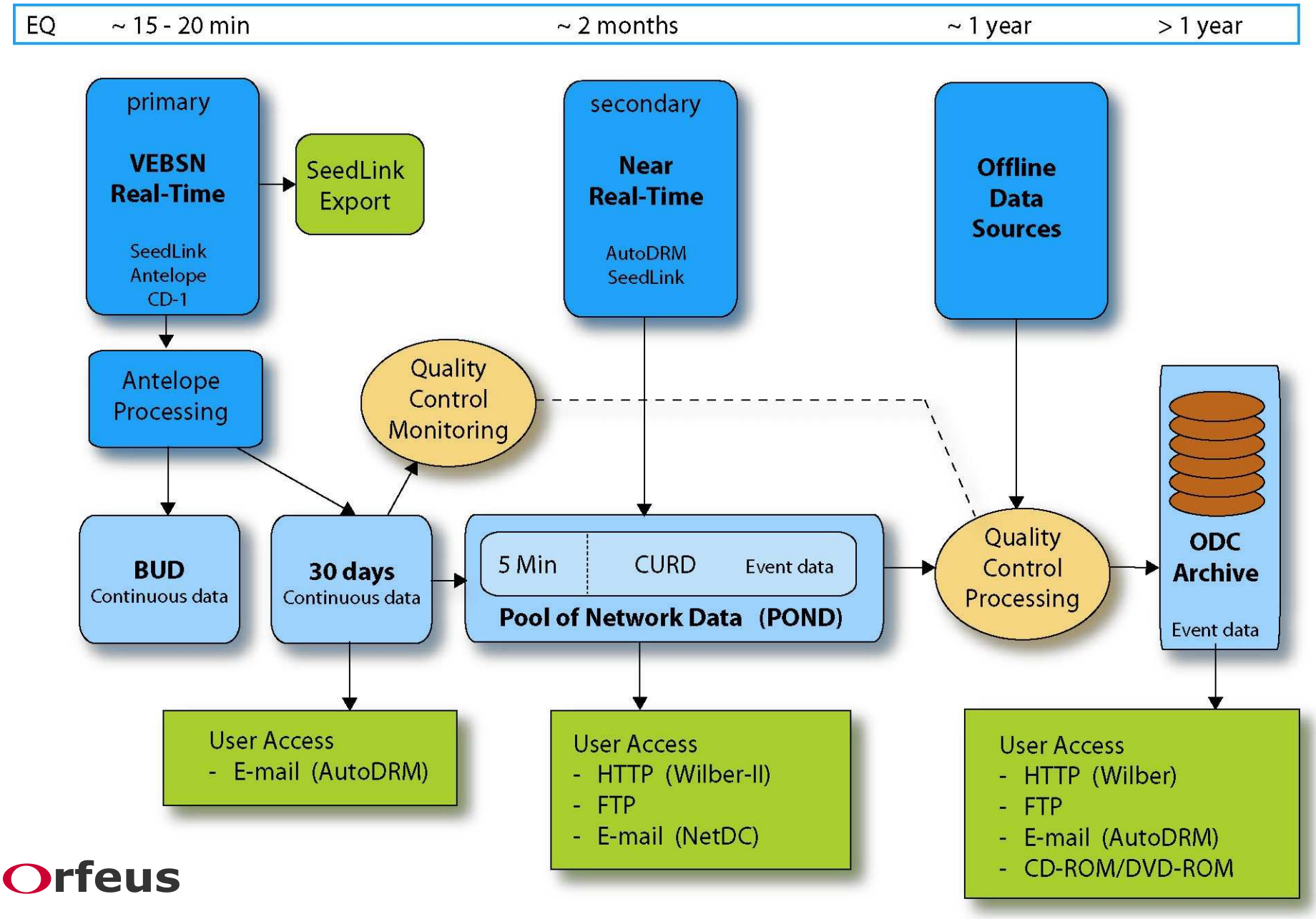
Virtual European Broadband Seismic Network (VEBSN)

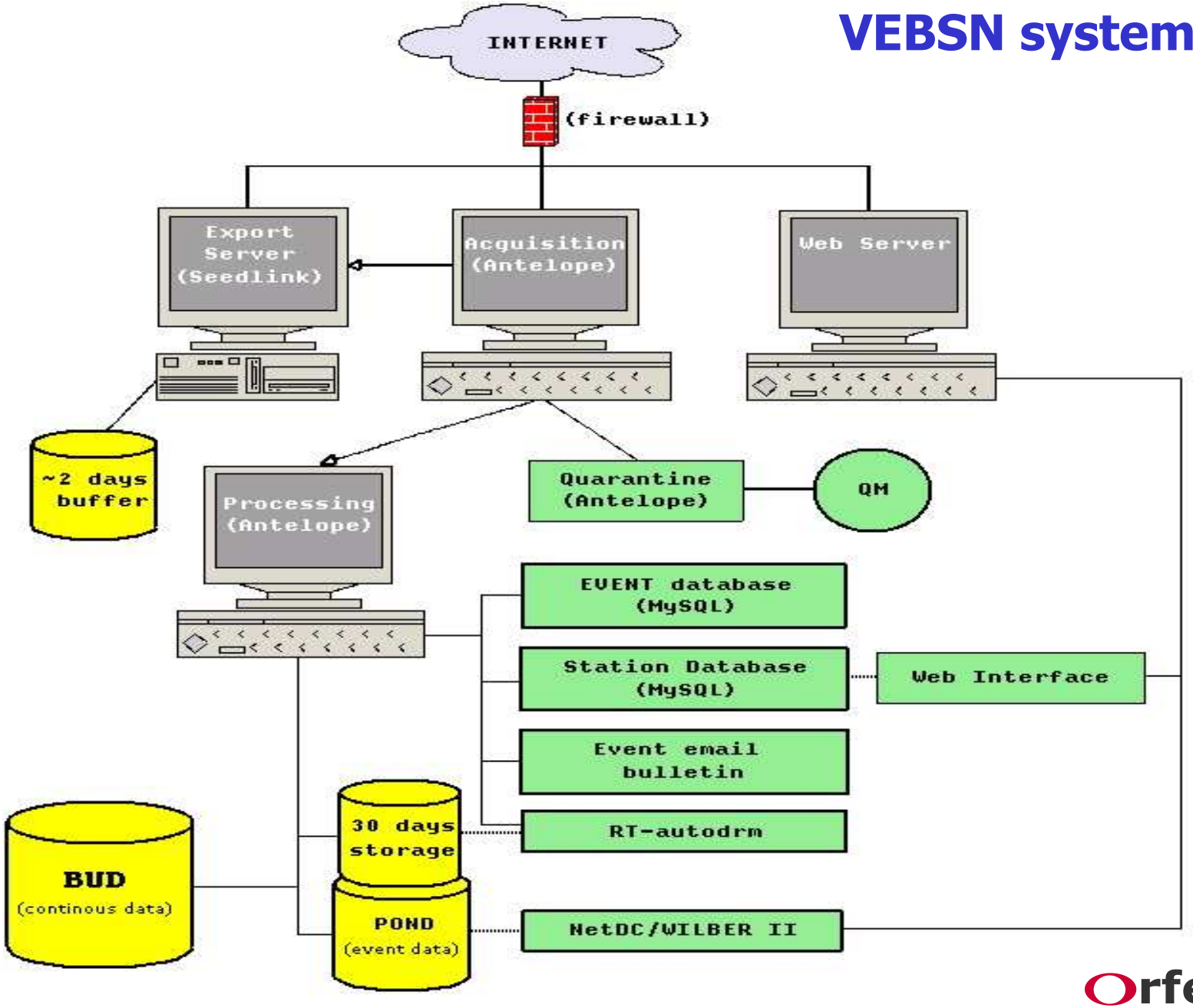
Torild van Eck & Lucas Calje
MEREDIAN and VEBSN contributors

VEBSN data within the ODC pipeline



Orfeus

VEBSN systems

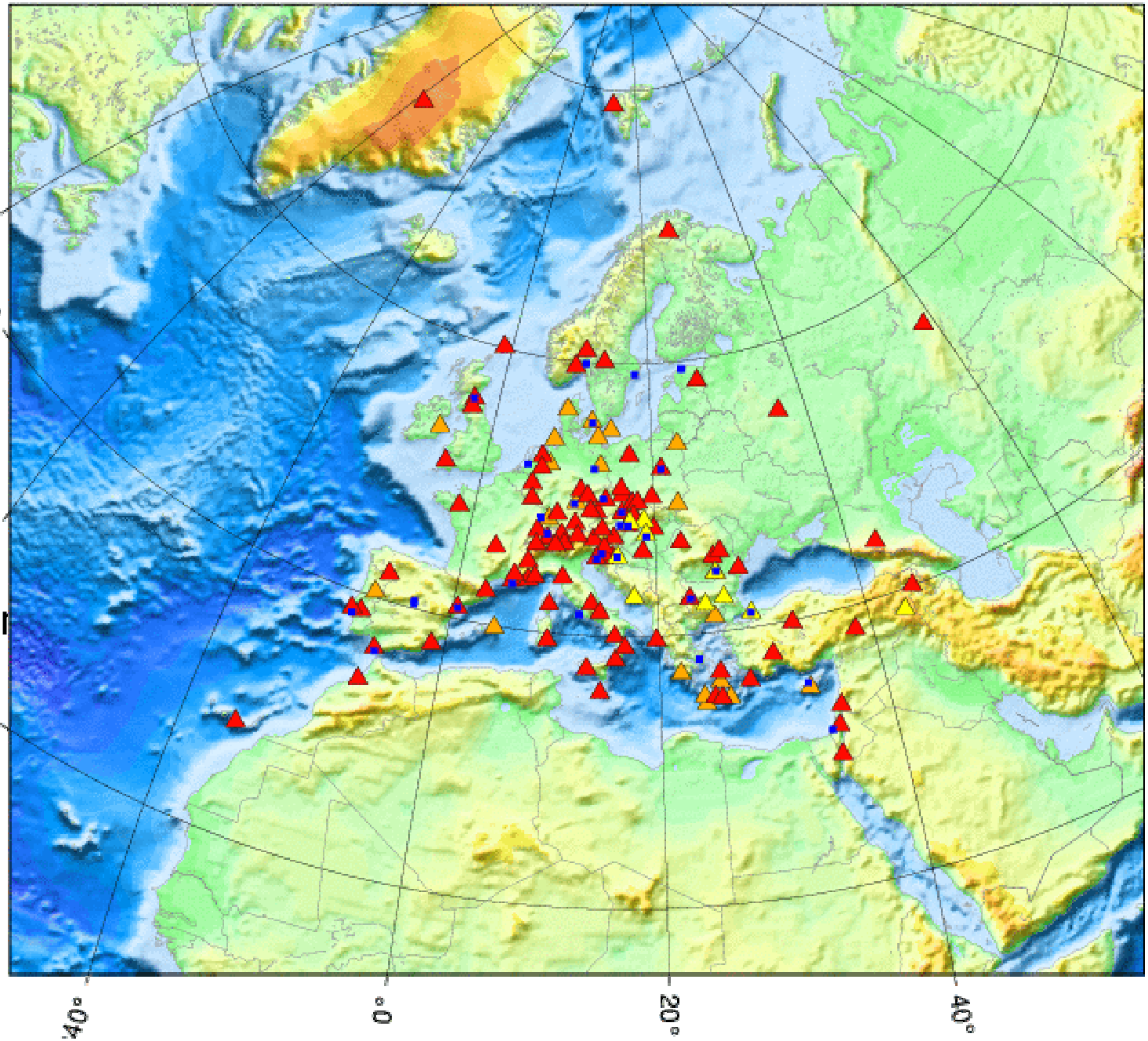


Orfeus

Virtual European Broadband Seismic Network (VEBSN)

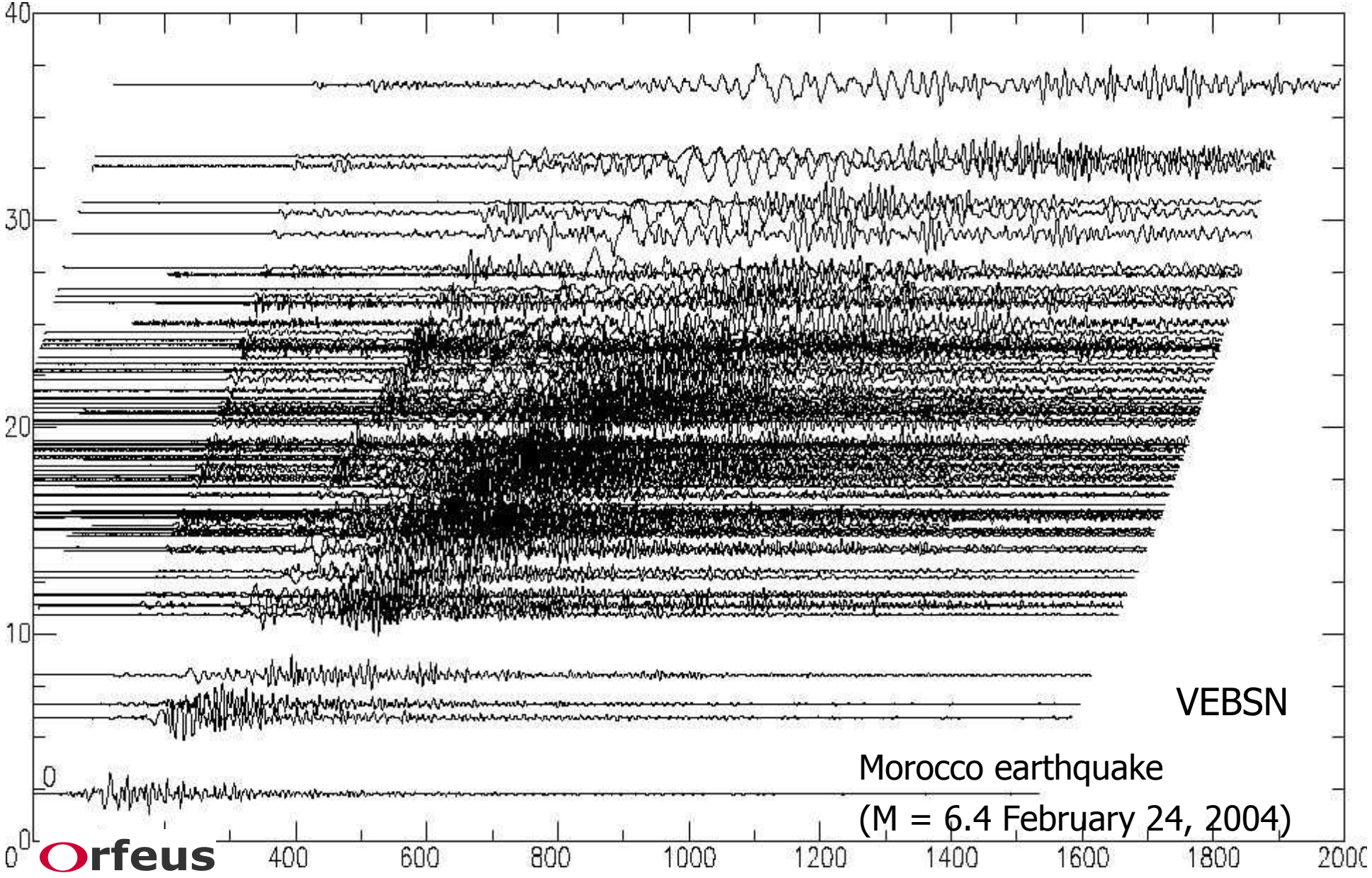
Status
November 2004
124 stations

Blue square:
Contributing
Network/agency
Red triangle:
Real-time station
(seconds – few mi
Orange triangle:
Real-time station
(1 hour delay)



Orfeus

VEBSN event data: example



VEBSN real-time status

last update: September 09 2004 14:38 UTC

ORB LIST

VEBSN

NETWORKS

CH
CZ
DK
ES
FR
GB
GE
GR
HF
HL
HU
II
IP
IU
MN
NL
NO
OE
RO
SK
SL
SS

LEGEND

Station is operating normally.
Station is reporting alert conditions.
Station has not reported.
Station has not been added to the database.

Fields to display:

- [ ] latency
- [ ] numchans

- [ ] Show alerts only

Update

NETWORK SUMMARY [22 networks total]

Network	# of stations	# expected	# of channels	min latency	median latency	max latency
SED, Swiss seismological service (ETH), Zurich, Switzerland	4	4	12	13 secs	15 secs	19 secs
Czech Seismic Network (GI-ASCR, Prague and IPE-MU, Brno)	8	8	18	15 secs	28 secs	52 secs
DK	3	3	0			
Spanish Seismic Network (IGN), Madrid, Spain	4	4	9	1 min	1 min	1 min
French Seismological Network (ReNaSS/INSU/CNRS), Strasbourg, Nice, Grenoble	7	7	21	2 mins	2 mins	4 mins
British Geological Survey	3	3	9	49 secs	1 min	20 mins
GEOFON Program (GFZ), Potsdam, Germany	32	32	87	15 secs	41 secs	1 hour
German Regional Seismic Network (GRSN), Erlangen, Germany	3	3	9	16 secs	28 secs	30 secs
FOI, Swedish Defence Research Agency	1	1	3	3 mins	3 mins	3 mins
National Observatory of Athens, Greece	4	4	12	22 secs	23 secs	33 secs
GGRI-Net, Hungary	1	1	3	28 secs	28 secs	28 secs
Global Seismograph Network (GSN:IRIS/IDA)	5	5	9	1 min	1 min	3 mins
Instituto Superior Tecnico, Lisbon, Portugal	2	2	6	11 secs	11 secs	13 secs
Global Seismograph Network (GSN:IRIS/USGS)	4	4	9	12 secs	51 secs	6 mins
MEDNET Project (INGV), Rome, Italy	15	15	33	17 secs	27 secs	40 secs
Dutch Seismic Network (KNMI), De Bilt, The Netherlands	3	3	9	13 secs	14 secs	20 secs
NORSAR, Kjeller, Norway	2	2	6	2 mins	2 mins	3 mins
Austrian Seismic Network (ZAMG), Vienna, Austria	6	6	18	33 secs	36 secs	48 secs
Romanian Seismic Network	4	4	6	22 secs	22 secs	1 hour
Slovak Network (GPI-SAS)	1	1	3	1 min	1 min	1 min
Slovenian Seismic Network (EARS), Ljubljana, Slovenia	3	3	9	28 secs	40 secs	42 secs
Single Station Observatories	1	1	3	16 secs	16 secs	16 secs

116 stations total
294 channels total

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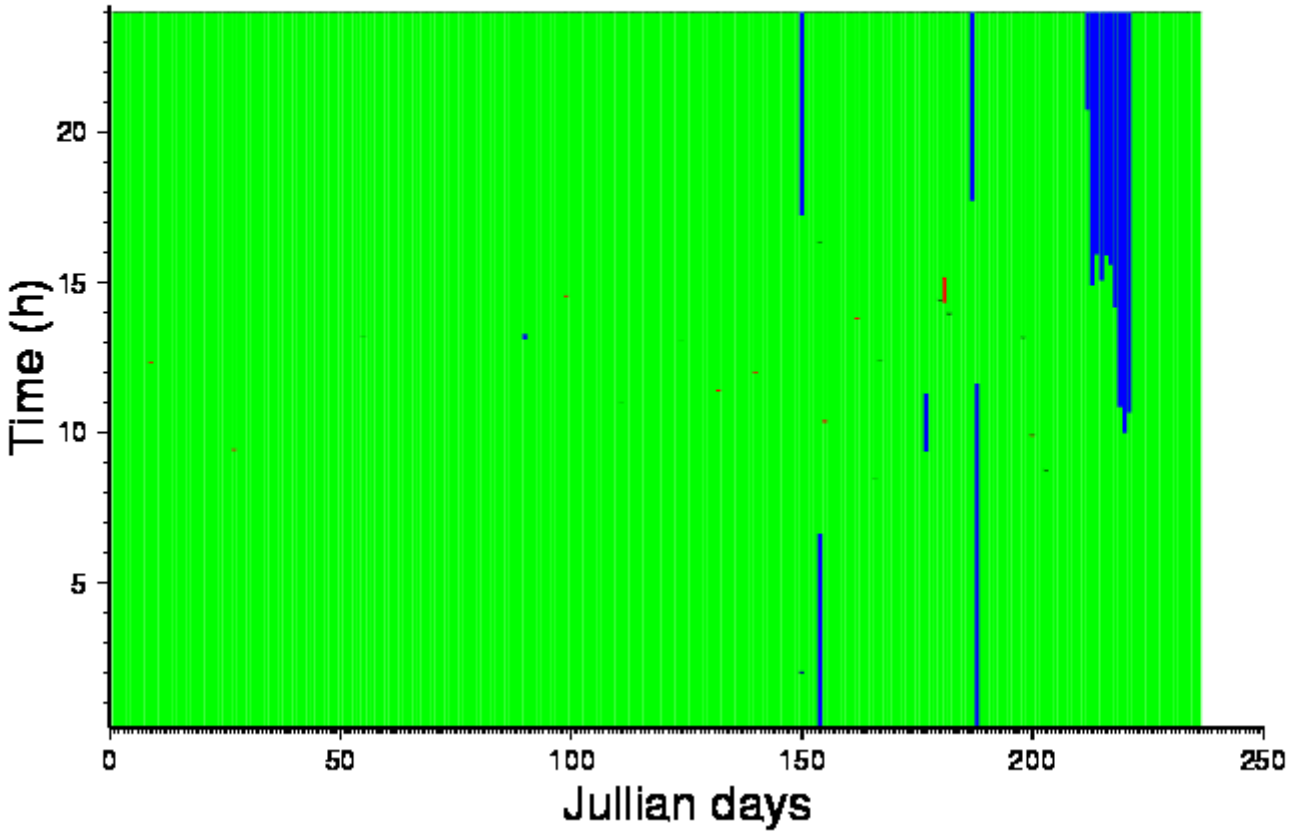
Communication and data availability monitoring

Data ok

Data overlap

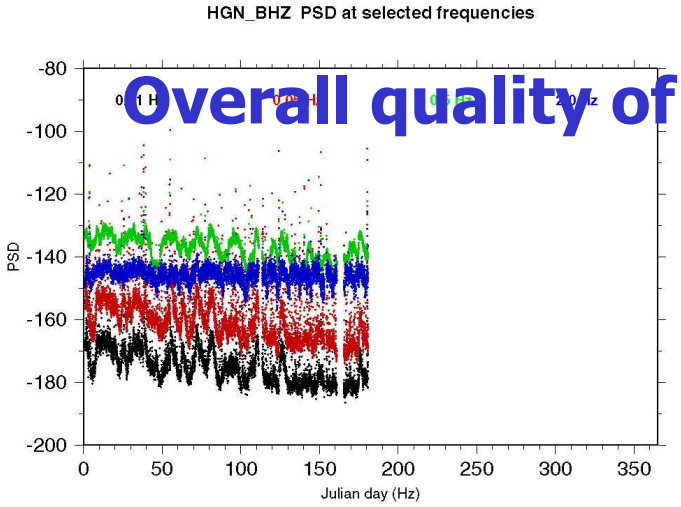
Data gap

HGN - NL - BHZ



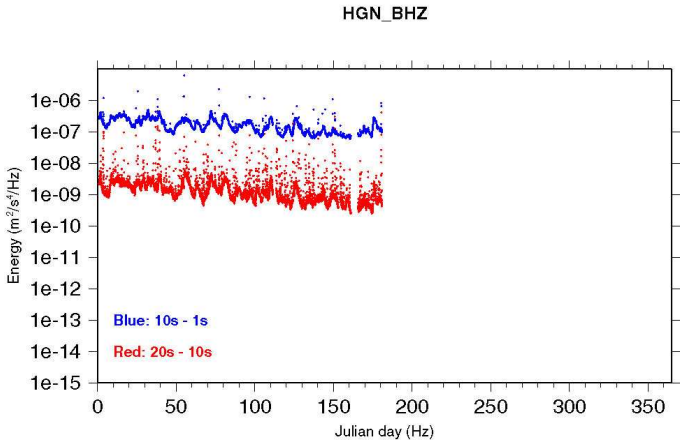
Orfeus

Overall quality of the data with time



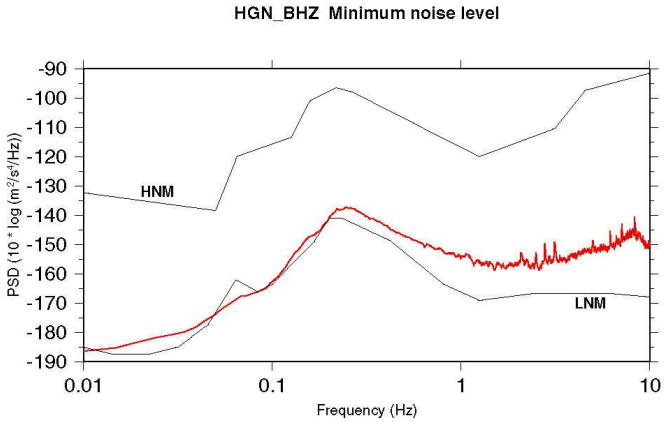
PSD at selected frequencies vs. time

(0.01, 0.05, 0.5, 2.0 Hz)



Noise energy in two frequency bands vs. time

(0.05 – 0.1 Hz and 0.1 – 1.0 Hz)



Minimum noise level

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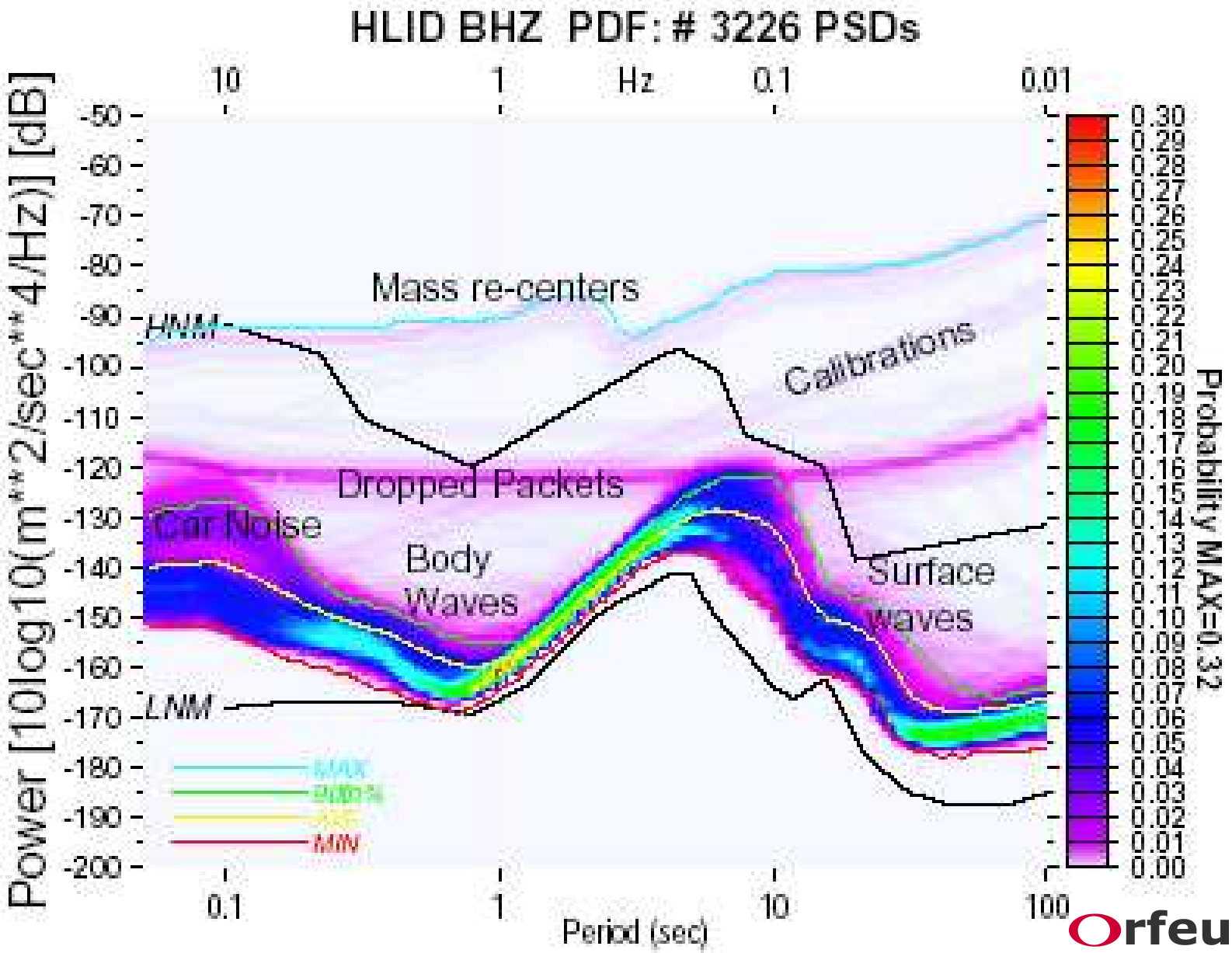
Statistical data quality check

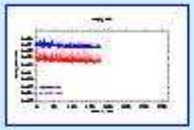


Orfeus

From: Daniel E. McNamara and Raymond P. Buland

Click on the image to enlarge

ANTO.BHZ



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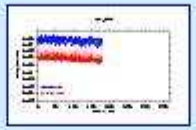

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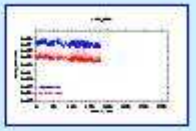

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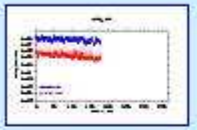

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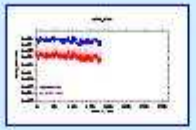

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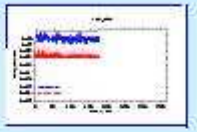

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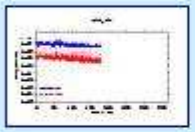

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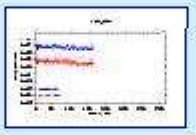

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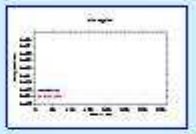

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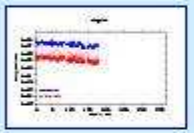

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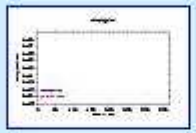

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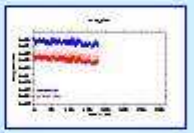

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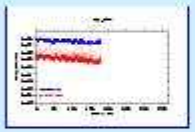

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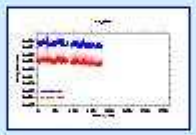

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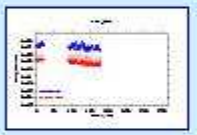

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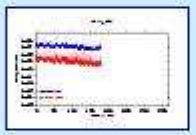

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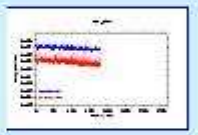

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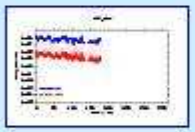

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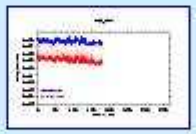

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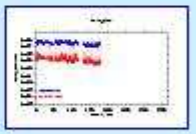

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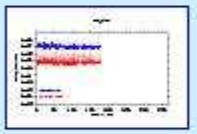

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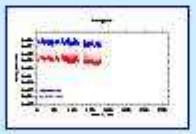

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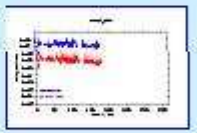

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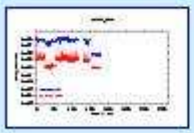

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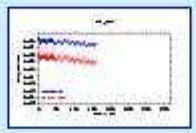

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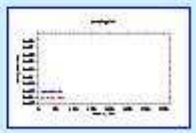

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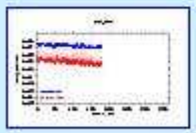

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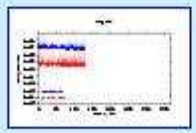

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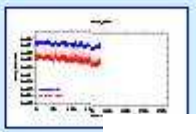

HLG.BHZ

IBBN.BHZ

ITM.BHZ

KBA.BHZ

KBS.BHZ

KEK.BHZ

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MEREDIAN CONSORTIUM (18 participants)

Royal Netherlands Meteorological Institute (KNMI) co-ordinator	NL
Instituto Geografico Nacional (IGN)	E
Istituto Nazionale di Geofisica e Vulcanologia (INGV)	I
National Observatory of Athens / Institute of Geodynamics (NOA-IG)	EL
GeoforschungsZentrum Potsdam (GFZ)	D
Centre National de la Recherche Scientifique (CNRS)	F
Zentralanstalt für Meteorologie und Geodynamic (ZAMG)	A
Eidgenössische Technische Hochschule Zürich (ETHZ)	CH
Norwegian Seismic Array (NORSAR)	NO
Environmental Agency Republic Slovenia (EARS)	SI
Geophysical Institute Academy of Sciences Czech Republic (IG-ASCR)	CZ
Geophysical Institute Slovak Academy of Sciences (GISAS)	SK
National Inst. of Research and Development for Earth Physics (NIEP)	RO
Geophysical Institute Bulgarian Academy of Sciences (BAS-GI)	BG
Institute of Geophysics Polish Academy of Sciences (IGFPAS)	PL
University of Malta (UOM)	MT
Geological Survey of Estonia (GSE)	EE
Geod. Geoph. Res. Inst. Hungarian Academy Sciences (GGRI-HAS)	HU

VEBSN contributors

MEREDIAN consortium (18) and 17 other agencies:

V
E
B
S
N

Geological Survey of Cyprus, Nicosia, Cyprus.
Danish National Survey and Cadaster, Seismology, Copenhagen, Denmark
Geological Survey of Estonia, Tallinn, Estonia.
Geoscope, Dép. de Sismologie, Inst. de Physique du Globe, Paris, France.
ReNaSS, Strasbourg/Nice/Grenoble, France.
German Regional Seismograph Network, Erlangen, Germany
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Instituto Superior Tecnico, Lisbon, Portugal
Universidad Complutense, Madrid, Spain
Real Observatorio de la Armada, San Fernando, Spain
Observatori de l'Ebre, Roquettes, Spain
Bogazici University, Kandilli Observatory and ERI, Istanbul, Turkey.
British Geological Survey, Edinburgh, UK.
IRIS/IDA network, Univ. of California, Scripps Inst. of Oceanography, USA.
IRIS/USGS network, USGS Albuquerque Seismological Laboratory, USA.

http://orfeus.knmi.nl/VEBSN