



TopoScandiaDeep Kick-Off Meeting Haraldvangen 21-22 January 2009

MAGNUS experiment: Overview and Status

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- Experiment
- Earthquake Distribution
- Data Processing
- Data Policy



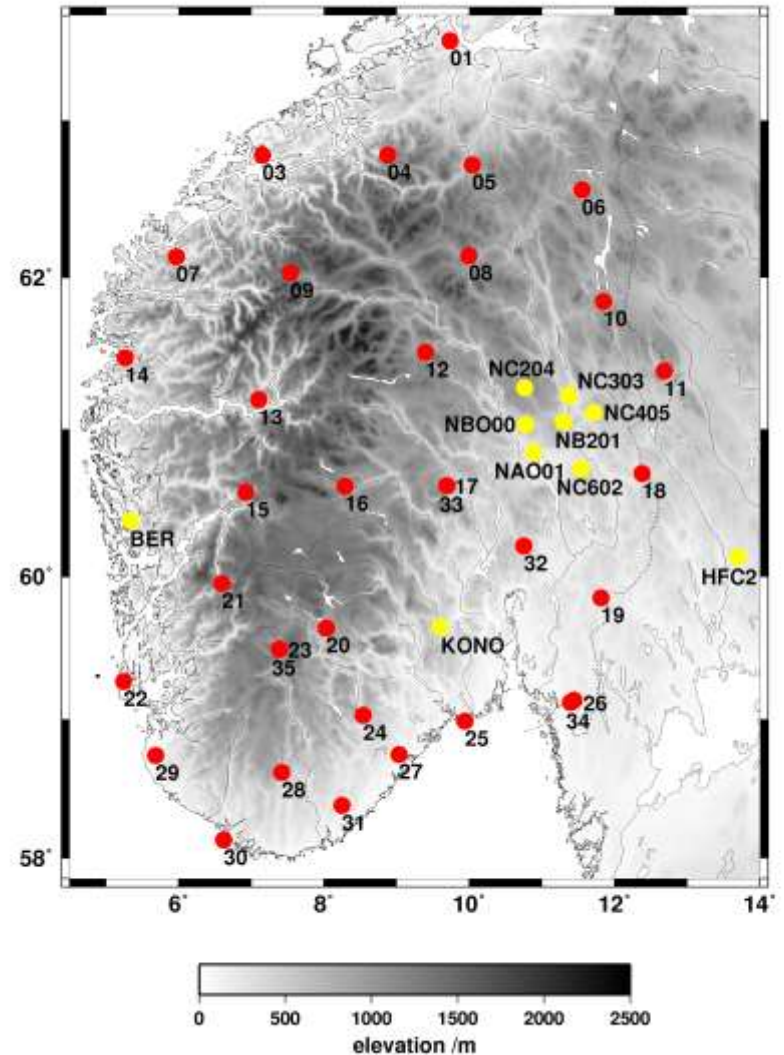


MAGNUS

Mantle Investigations of Norwegian Uplift Structures

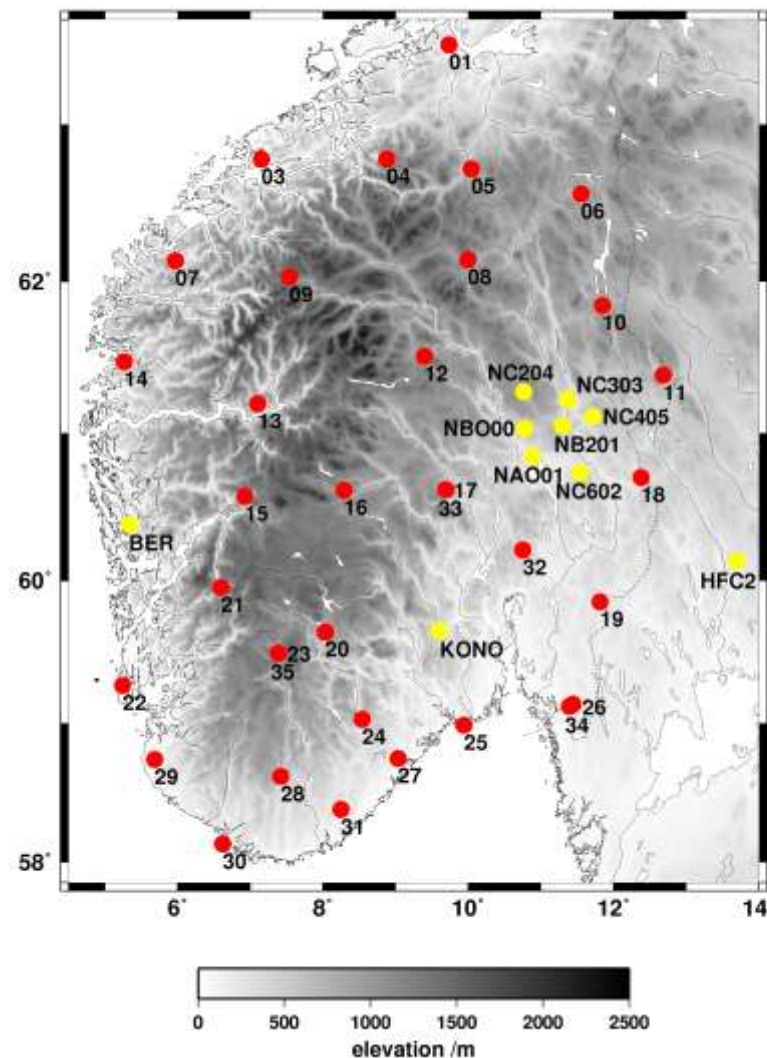
Sept. 2006 – Juni 2008

Uni KA, Uni Oslo, NORSAR, Uni
Kopenhagen, Uni Århus



Key elements of MAGNUS

- completely broadband (100-120 s; 2 stations with 30 s)
- homogeneous station coverage of Southern Norway
- homogeneous dataset
- continuous recording (50 samples/s)





Event Selection

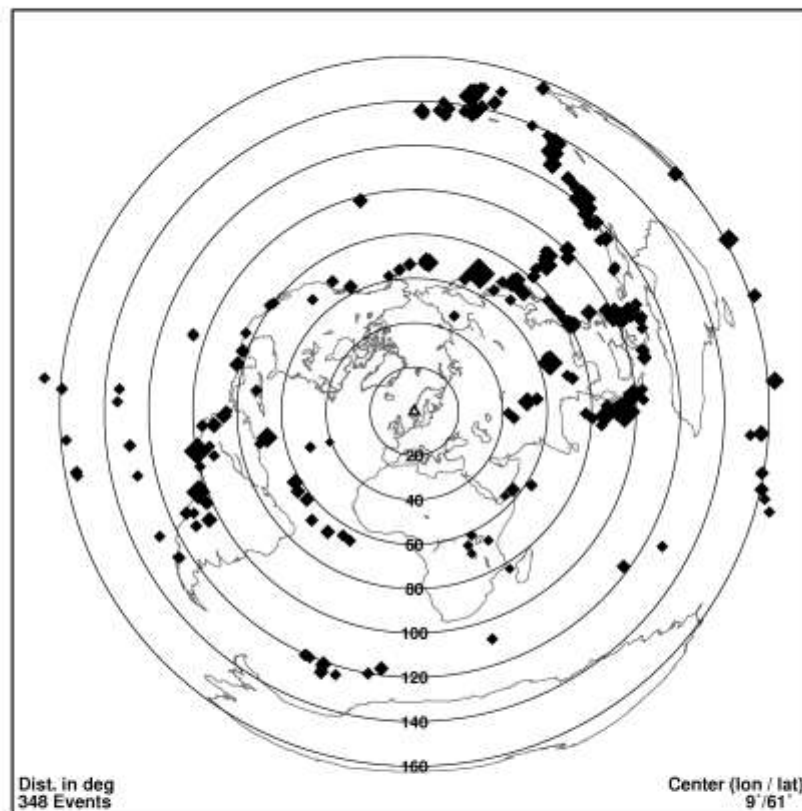
- 348 teleseismic events ($M_w \geq 6.0$)
incl. African events: $M_w \geq 5.0$
- 73 regional events ($M_w > 5.0$)

- Lists:

Y	M	D	DATE	LAT	LONG	DEP	DIST	BAZ	AZ	Mw	mb	Ms	REGION
2006	09	09	041312.06	-7.219	120.106	572	106.883	74.284	331.416	6.3	6.0		FLORES SEA
2006	09	12	133055.66	-28.944	-68.898	114	108.844	244.563	30.538	6.0	5.8		LA RIOJA PROVINCE, ARGENTINA

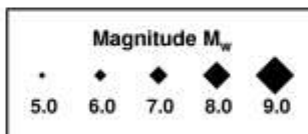
348 teleseismic events

MAGNUS project - distribution of seismic events



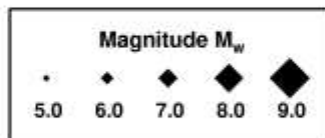
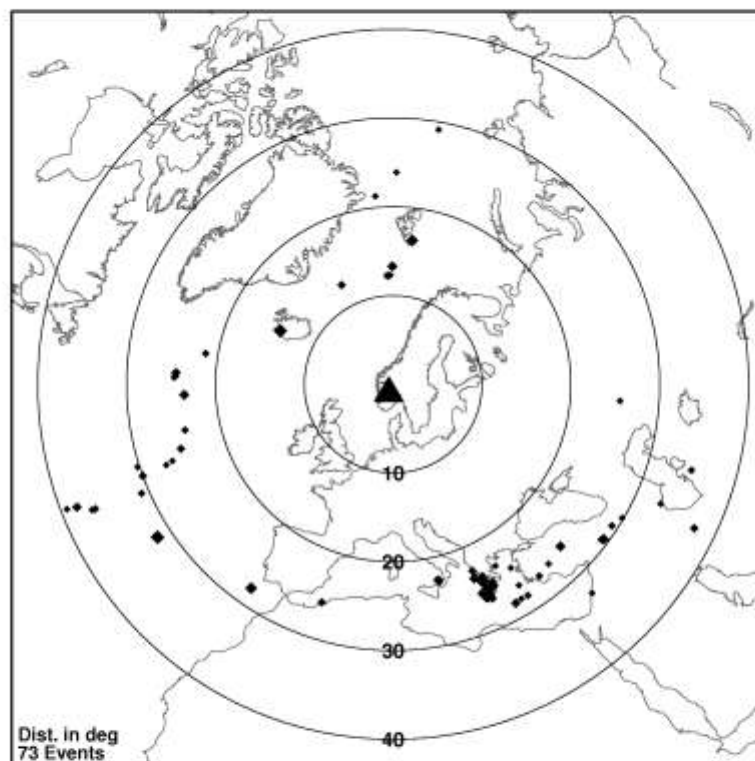
Dist. in deg
348 Events

Center (lon / lat)
9°/61°



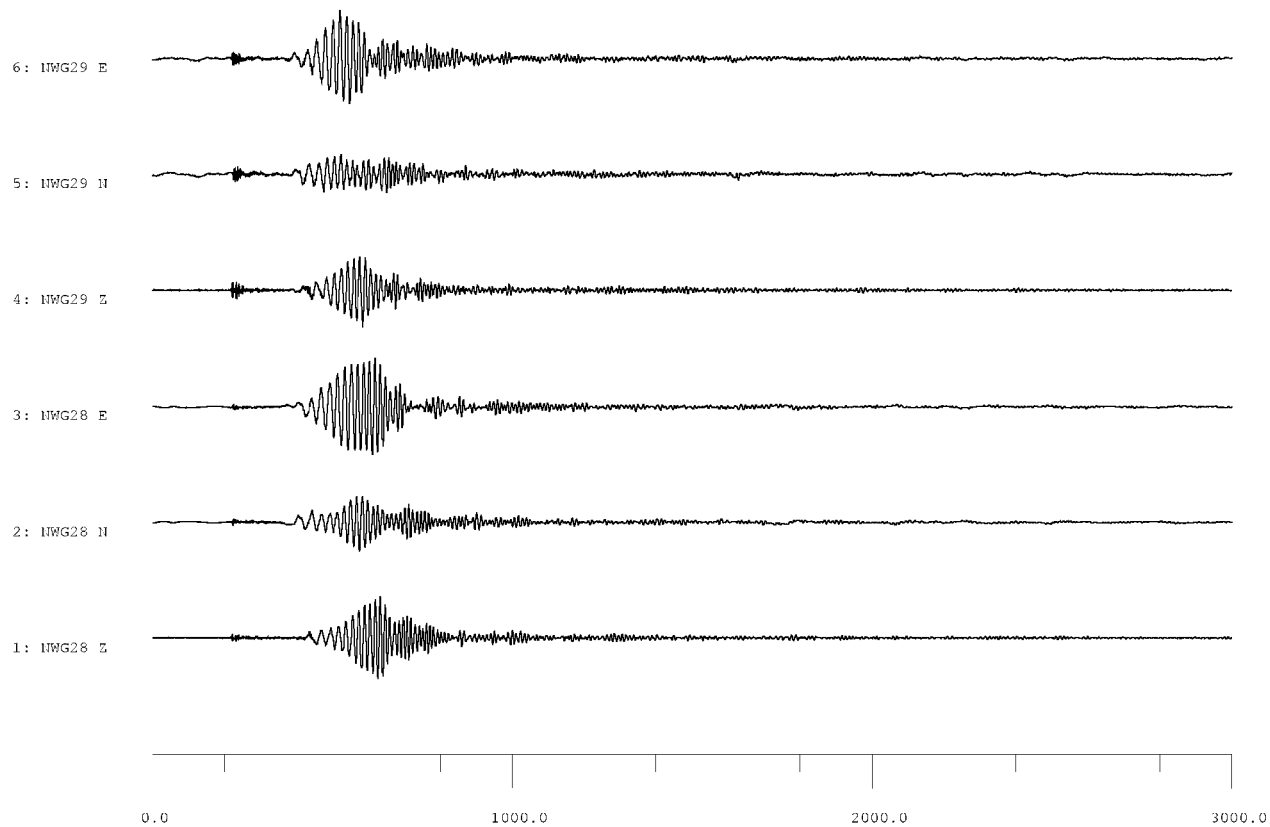
73 regional events

MAGNUS project - distribution of seismic events





Waveform Example – Iceland Event

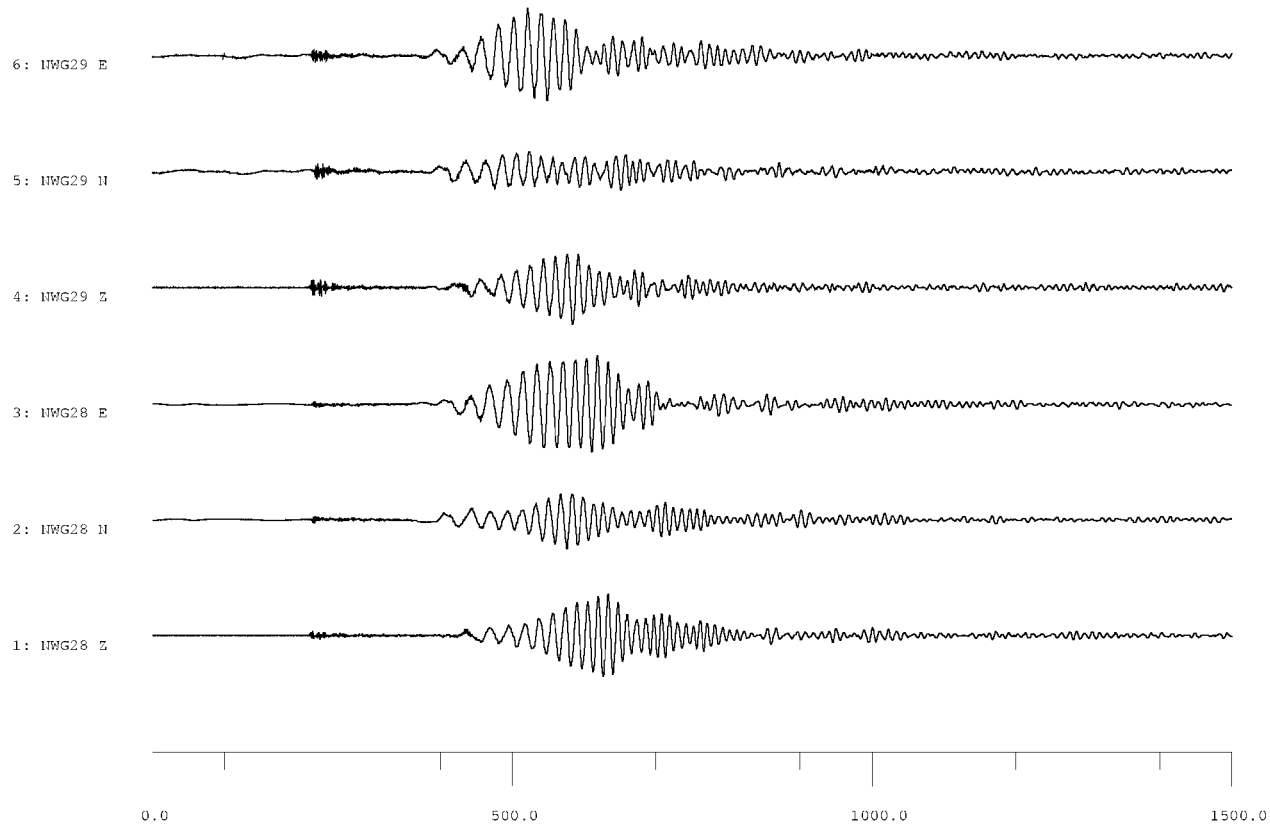


29/05/2008 15:46:00 ICELAND MW 6.3

NORM AF



Waveform Example – Iceland Event

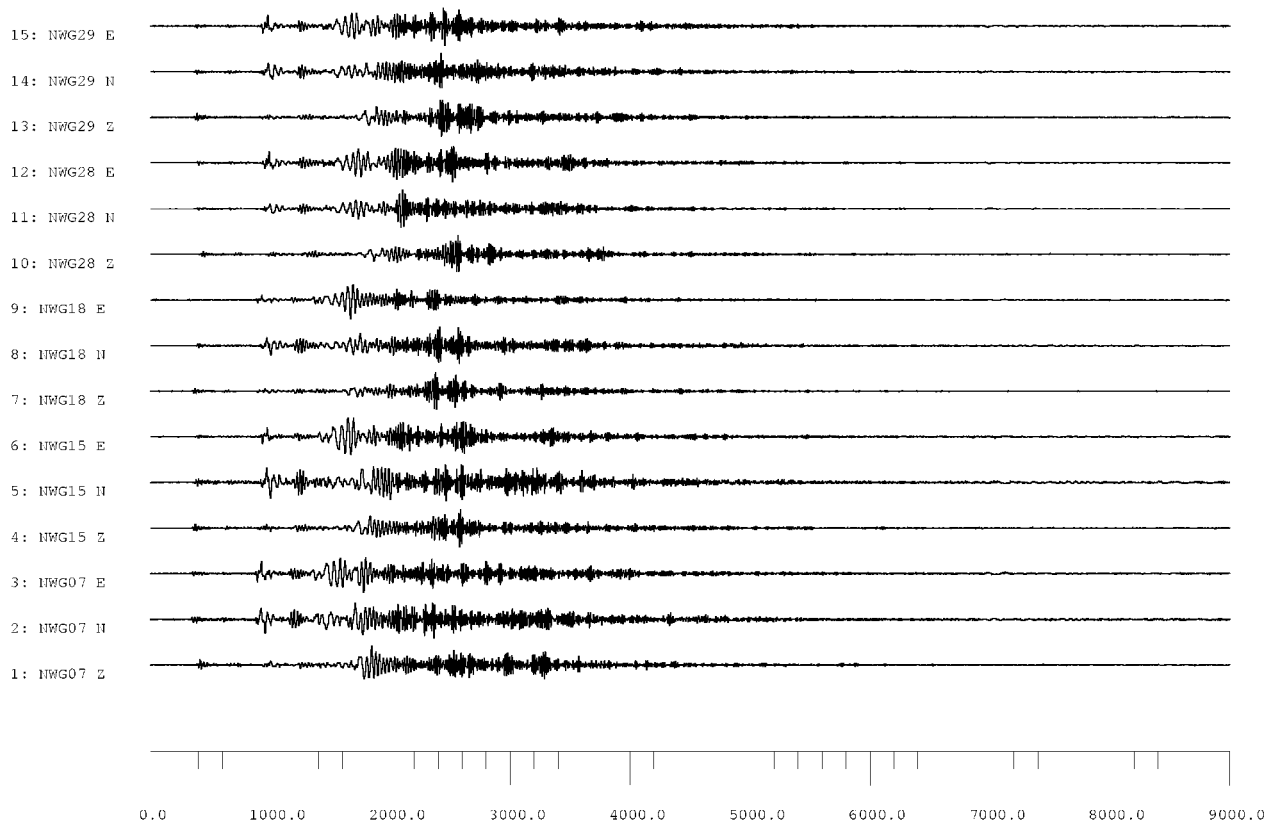


29/05/2008 15:46:00 ICELAND MW 6.3

NORM AF



Waveform Example – Kuril Islands Event

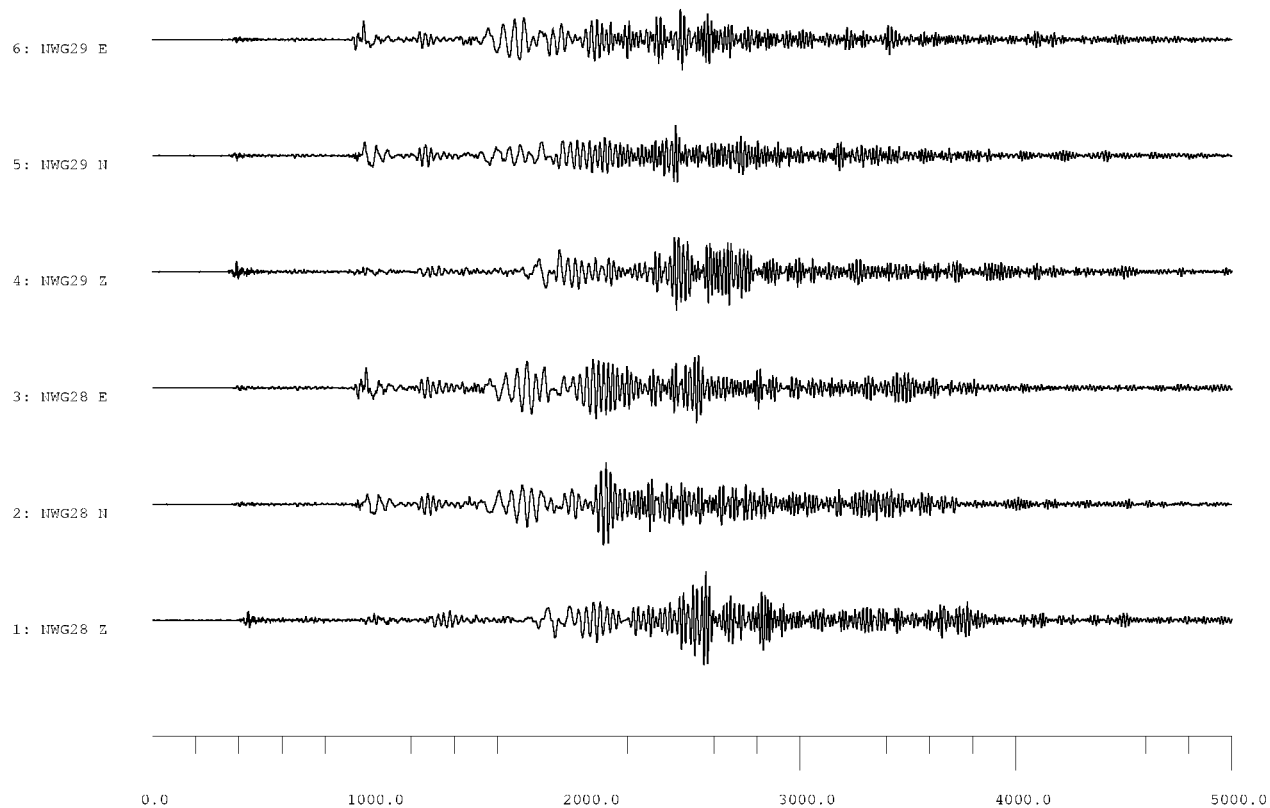


15/11/2006 11:14:13 KURIL ISLANDS MW 8.3

NORM SW



Waveform Example – Kuril Islands Event



15/11/2006 11:14:13 KURIL ISLANDS MW 8.3

NORM AF



Data Processing

KABBA data

- KA will coordinate the data processing
- KA will provide event directories (lists distributed)
- KA will provide raw data in miniSEED
- KA will provide deconvolution parameters, station information, station photographs
- KA will provide a list with problems at the stations

permanent stations

- NORSAR will send event directories to KA
- KA will convert data to miniSEED and copy data files in event directories
- KA will provide deconvolution parameter as far as possible



Time Windows

- teleseisms $M_w \leq 6.5$: 360 s before P-arrival, 3,600 s after P-arrival
- teleseisms $6.6 \leq M_w \leq 7.5$: 360 s before P-arrival, 9,000 s after P-arrival
- teleseisms $M_w > 7.5$: 360 s before P-arrival, 14,400 s after P-arrival
- regional events $M_w > 5.0$: 360 s before P-arrival, 3,600 s after P-arrival

- MAGNUS-REX ?



Data Processing

KABBA data – complete continuous recordings

- KA will provide all raw data in miniSEED on a USB hard disk
→ NOR SAR / Uni Oslo
- KA will set up the WebDC system for download



MAGNUS Sensors

KABBA

- 23 STS-2 (120 s)
- 6 KS2000 (100 s)
- 2 Güralp 40T (30 s)

Deconvolution: KA provides a description incl. poles, zeros, T_0 , d , a and GSE-2 header

NORSAR

- 6 KS54000 (XXX s)
- 1 Güralp 3T (XXX s)

Deconvolution: NORSAR

KONO

- STS-1 (X s)

Deconvolution: IRIS ? Orfeus ?

BER

- SL-210, SL-220

Deconvolution: IRIS ? Orfeus ?

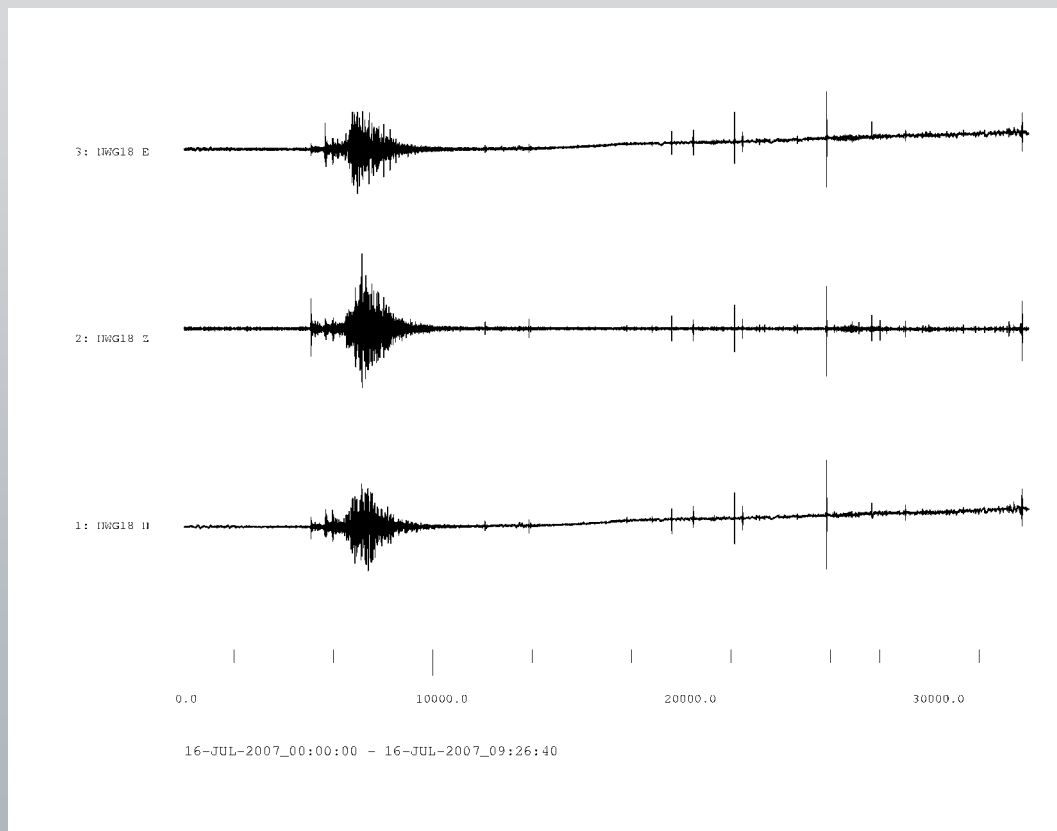
HFC2

- ? (X s)

Deconvolution: IRIS ? Orfeus ?

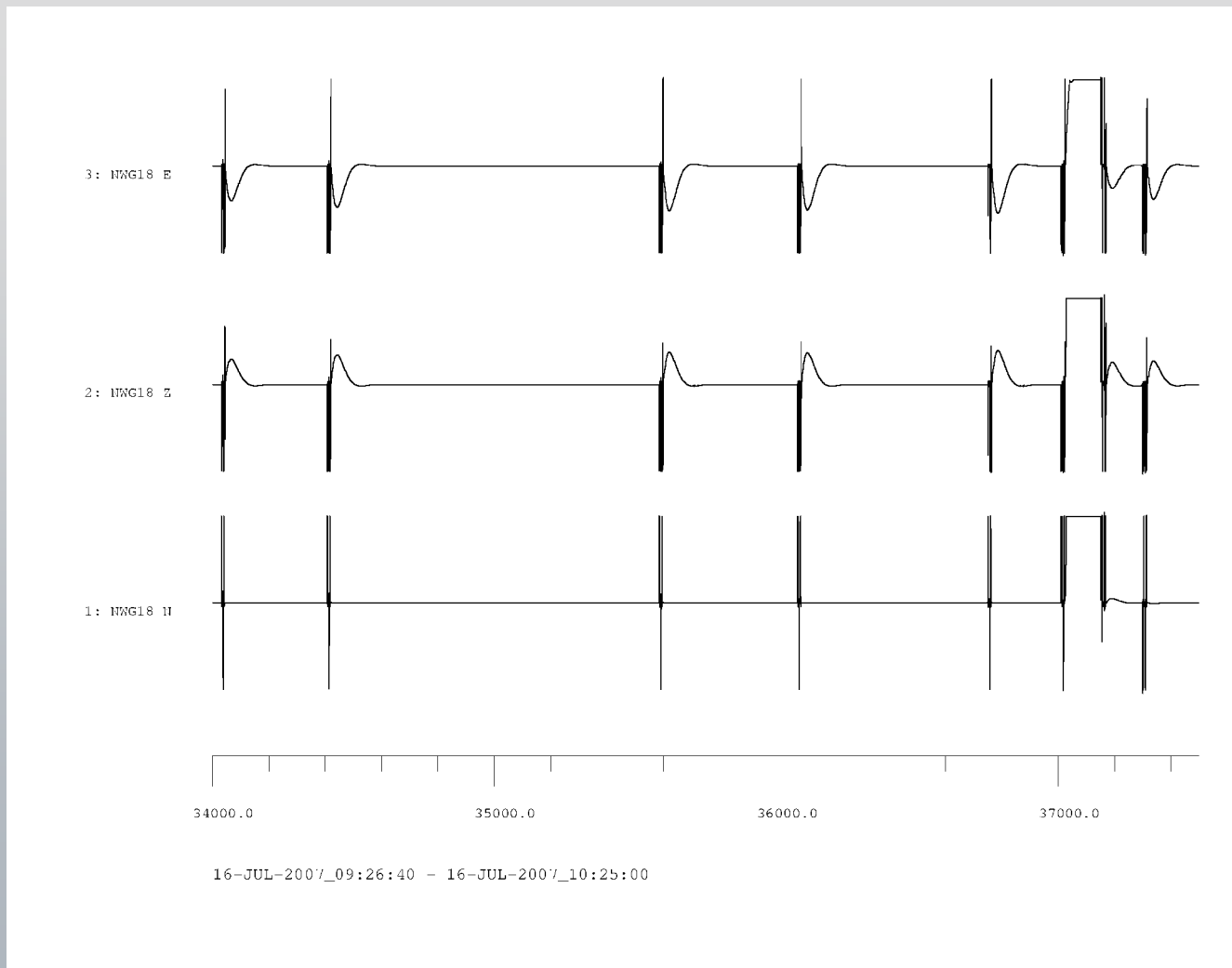
Recording Specialties – AMP

- AMP at STS-2 sensors
automatic mass positioning



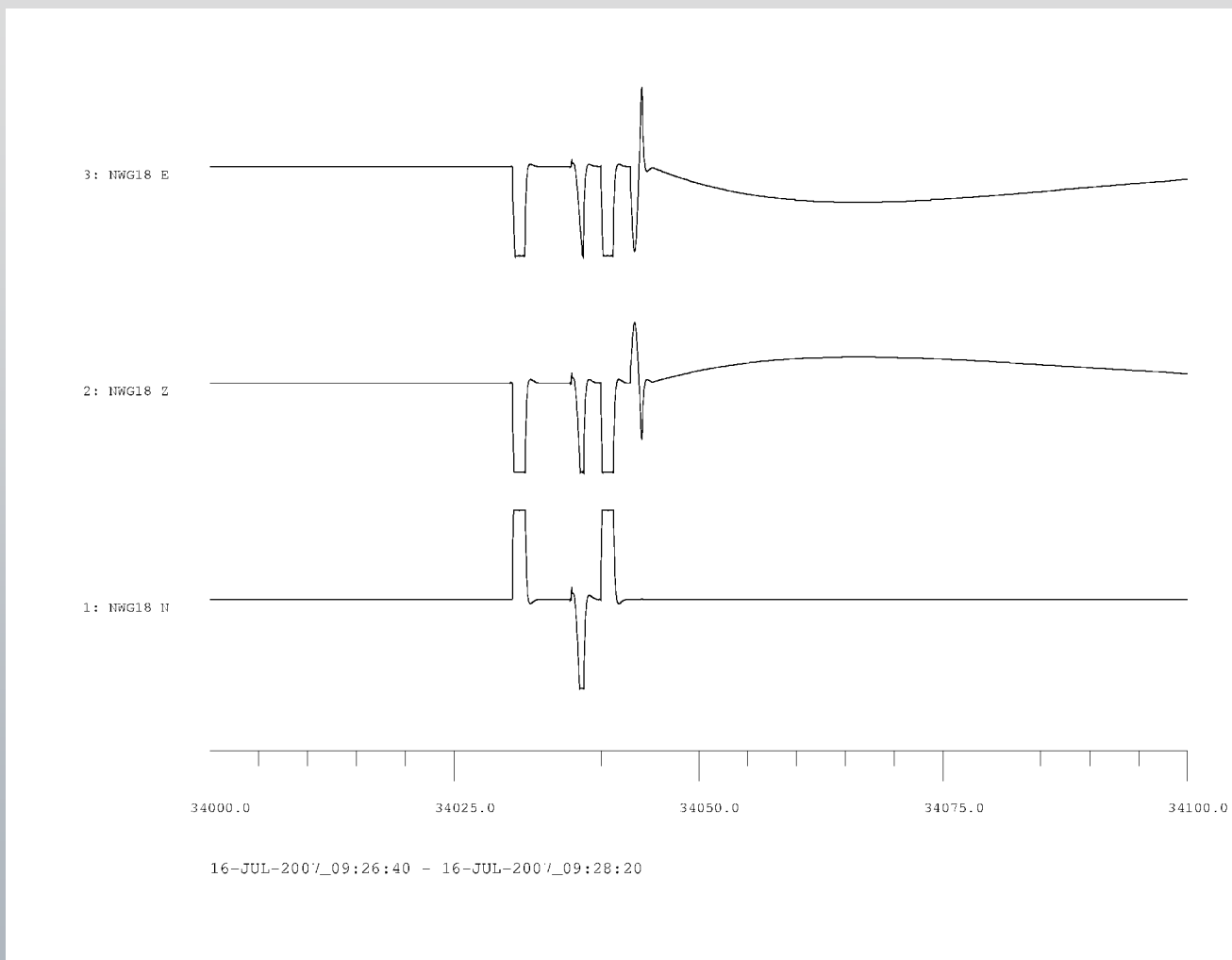


Recording Specialties – AMP



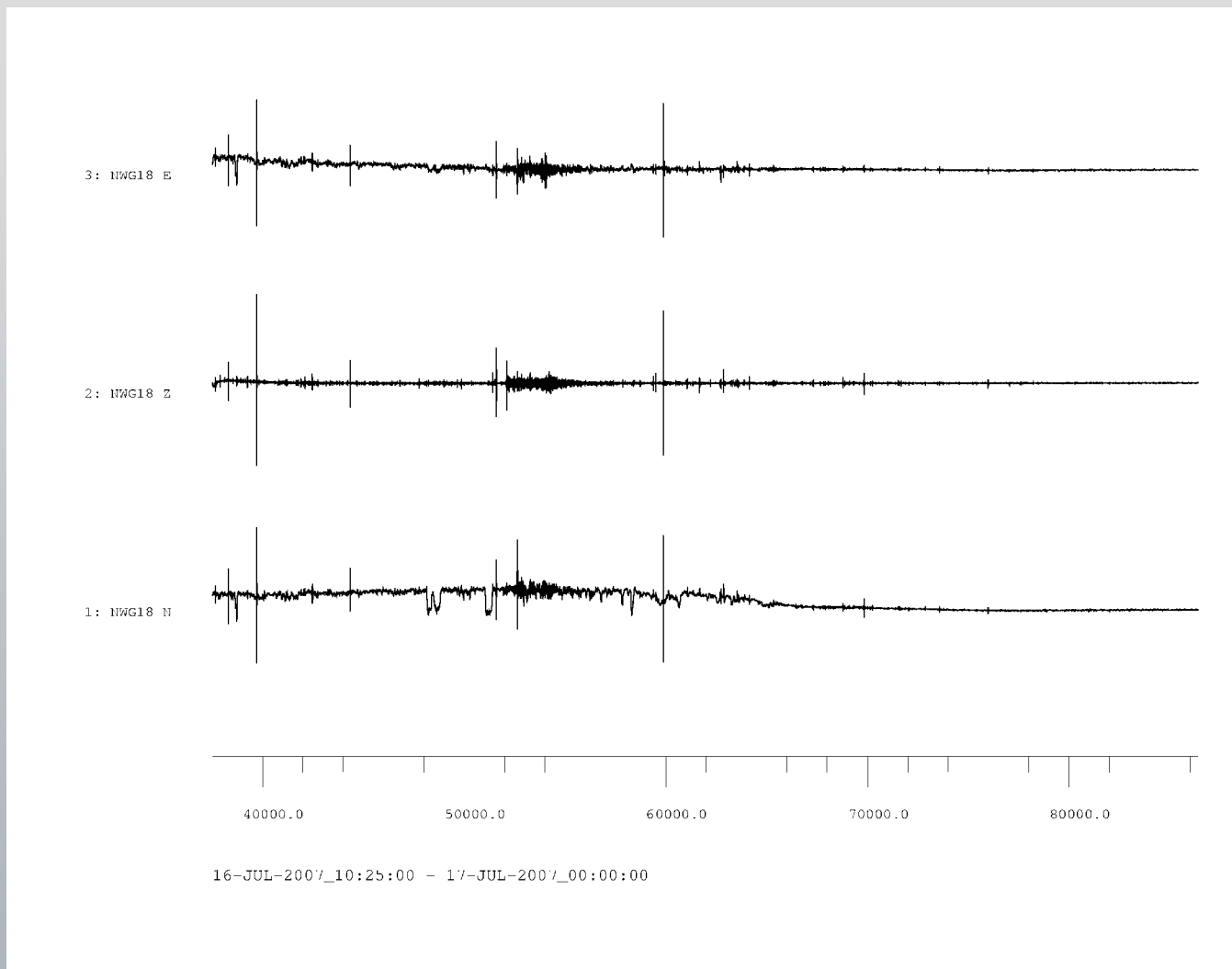


Recording Specialties – AMP





Recording Specialties – AMP



change of software parameters up to May 2007



Recording Specialties - Problems

- **Sept.-Nov. 2007 5 min gaps every 6 h**
- **NWG09 Nov 2007 – April 2008 offset failure (178 days)**
- **NWG16 16 days offset failure**
- **NWG20 34 days power failure**
- **NWG21 07 days offset failure**
- **NWG26 90 days failure**
- **NWG32 22 failure**

change of software parameters up to May 2007

Data Policy - KABBA Data

- KABBA data are free !
- However: For the first three years data usage is restricted to the partners of MAGNUS (Unis Århus, Copenhagen, Karlsruhe & Oslo and NORSAR) !

data usage is distributed:

Århus: teleseismic P-wave tomography

Copenhagen: teleseismic P-wave RF

Karlsruhe: teleseismic S-wavefield (tomo, RF, SKS)

Oslo: surface waves

NORSAR: local/regional events

→ cooperations within these field are allowed with third parties

- Unrestricted use after 2011



Recommendation for Acknowledgements !!

MAGNUS waveforms were recorded with the mobile Karlsruhe BroadBand Array of the Universität Karlsruhe (TH), Germany [and the NORSAR Array, Norway ?]

Financial support for the MAGNUS experiment was provided by the Universities of Århus, Copenhagen, Karlsruhe and Oslo as well as NORSAR.

KA: Data analysis was supported by the Deutsche Forschungsgemeinschaft (grant RI1133/8) within the EUROCORE programme TOPO-EUROPE of the European Science Foundation.



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