



ISTITUTO NAZIONALE DI OCEANOGRAFIA E DI GEOFISICA SPERIMENTALE

Antelope @ OGS (Udine, Italy)

D. Pesaresi, P. L. Bragato, A. Saraò, *A. Michelini*, E. Priolo,
P. Comelli, P. Di Bartolomeo, P. Bernardi, *G. Costa*

dpesaresi@inogs.it

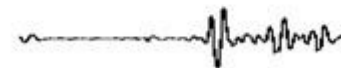
Ist. Naz. di Oceanografia e di Geofisica Sperimentale – OGS
Udine (ITALY)



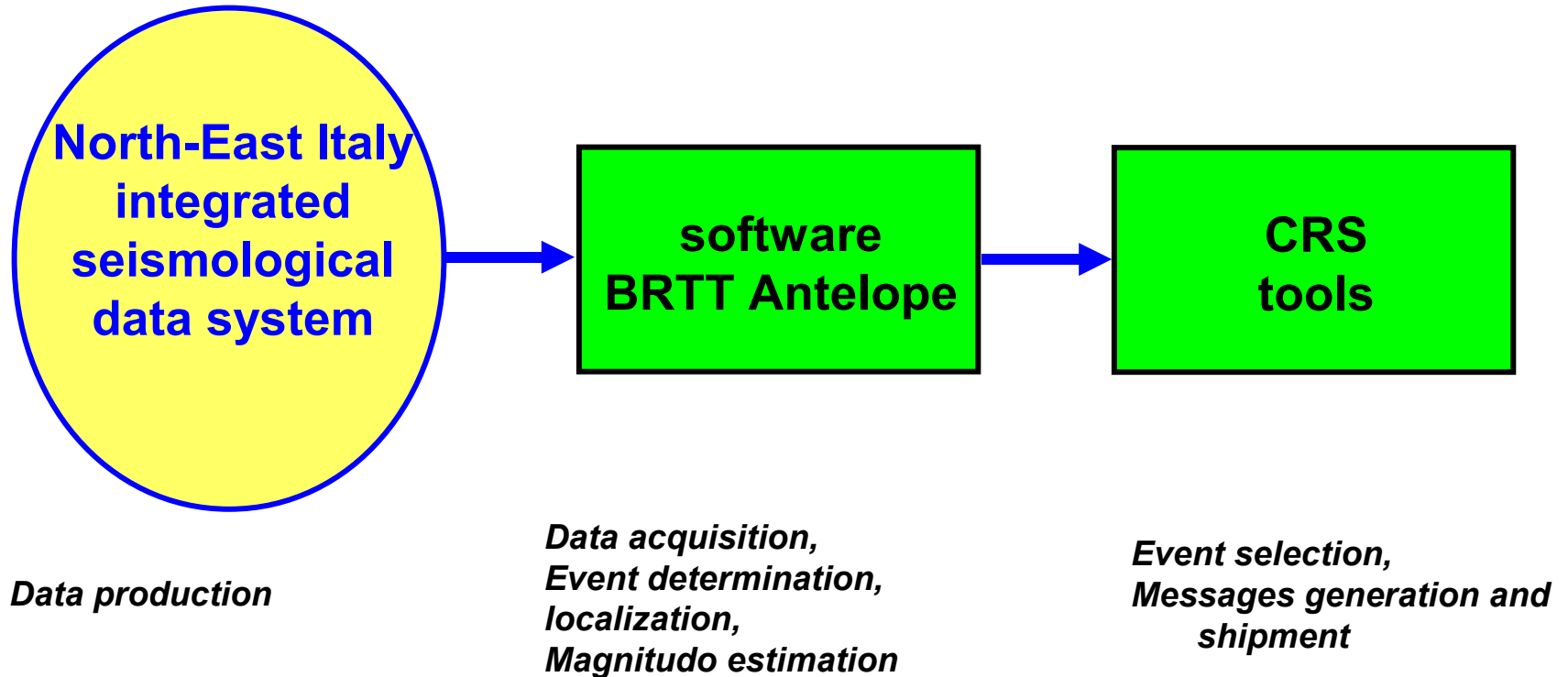
QAUG 2009
Marrakech, March 2009

المعهد الوطني للجيوفيزياء

NATIONAL INSTITUTE OF
GEOPHYSICS (ING)



Antelope @ OGS



NE Italy seismology - OGS

3 contracts (FVG, Veneto, TN) and 5 data sharing agreements [INGV (Italy), ZAMG (AUT), ARSO (SLO), DST (Italy), BZ (Italy)].



Facts

- 78 real time stations
 - 56 continuous
 - 22 on trigger
 - 9 networks (FV, NI, OE, RF, SI, SL, MN, TN & IV)
 - 6 Q3302orb
 - 3 qt2orb
 - $22 + 7 + 9 = 38$ slink2orb
 - 40 orb2orb
- Data rate 2GB/day

Facts2

- 4 machines
 - 1 SUN cluster (Sun-Fire-V240)
 - 1 SUN workstation (Sun-Fire-V245)
 - 2 Linux PC
- Antelope 4.10
- 3 different LAN subnetworks [OGS-Udine (main), OGS-Trieste (replicate), Palmanova (FVG Civil Protection)]

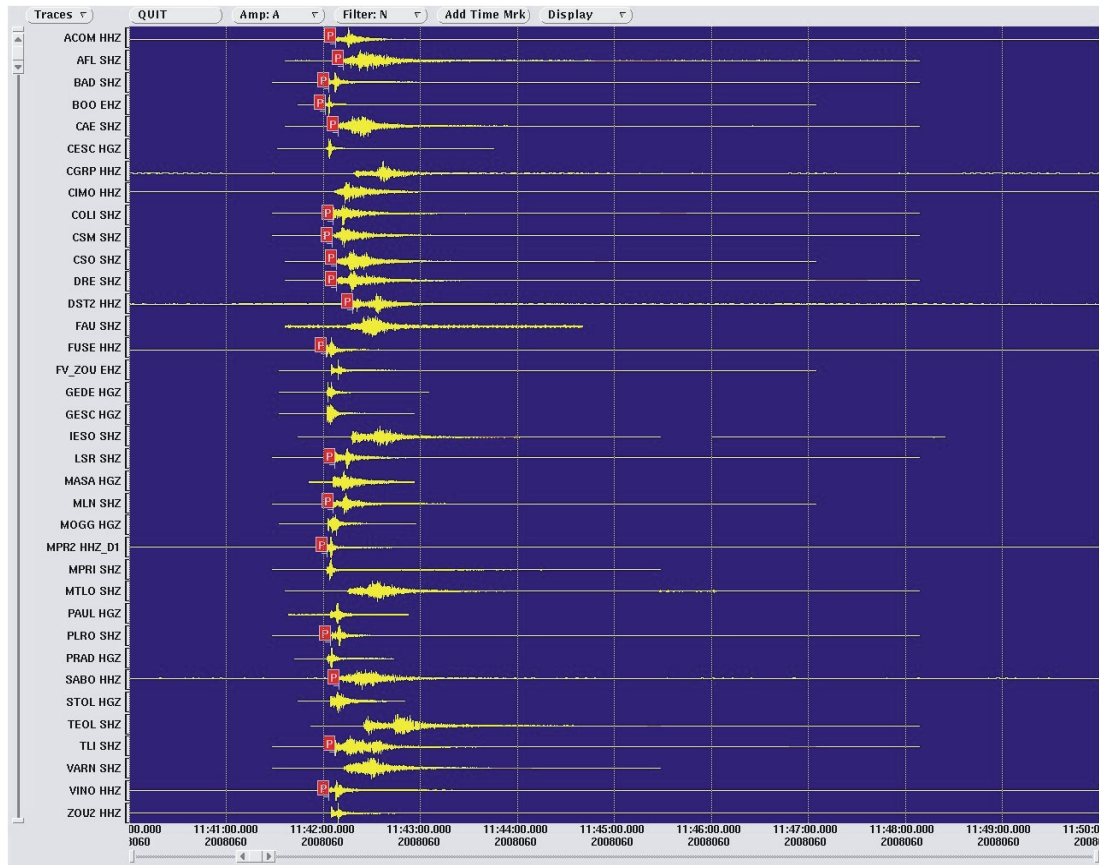
Dbrecenteqs

The screenshot shows the CRS website interface. At the top, there is a navigation bar with the CRS logo and a search box. Below this is a banner for the Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (INGV). The main content area features the text "Earthquake: NORTHERN ITALY" and a map of Northern Italy. The map displays several earthquake locations marked with squares. A yellow arrow points to a specific location, labeled as the "Preferred localization". A black arrow points to a cluster of other locations, labeled as "Alternative localizations". The browser's taskbar at the bottom shows various open applications, including "start", "Desktop", "CoreDRAW 12", "Microsoft PowerPoint", "Posta", "CRS Home", "Download", "Acrobat Reader", and "1.41".

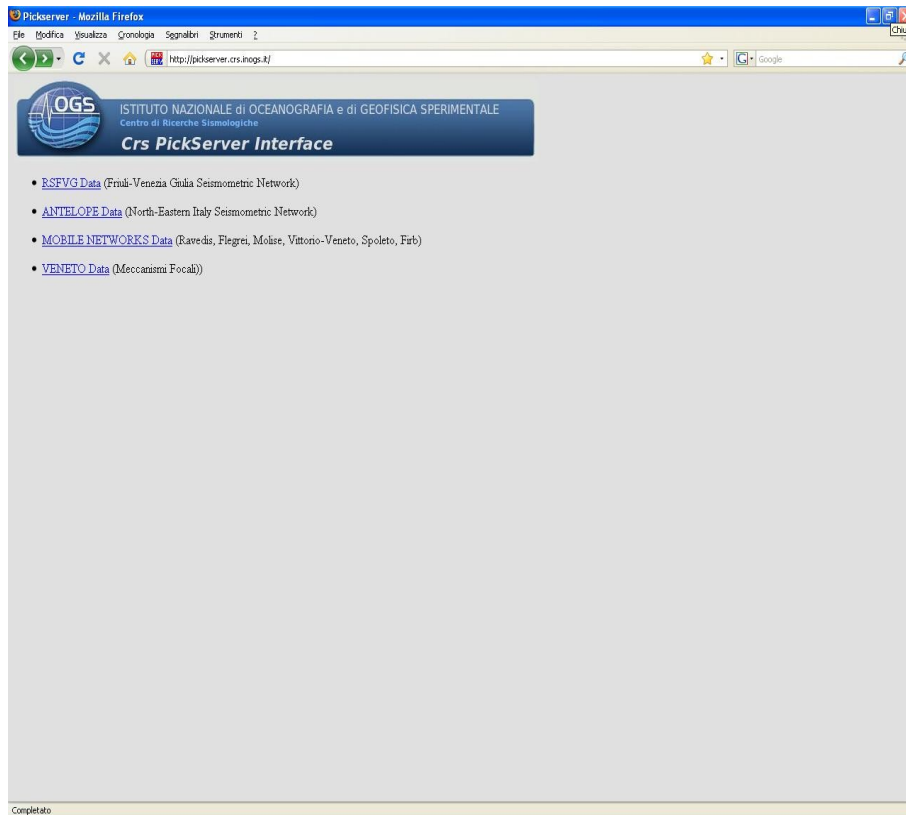
**Preferred
localization**

Alternative localizations

dbpick



OGS PickServer



- Accessible via web
- Automatic waveform data import from Antelope
- Operator manual export of event data to Antelope

OGS PickServer 2

The North-Eastern Italy Seismometric Network

Bulletin revision

ANTELOPE_15MIN event list: 2009-03-09 07:49:50

SV SP ID	SV SP ID	NS BR	TR SP	AA BR	ENGV BR	IS BR	GE BR
BOO.DI	ACRZ	ACOM.DI	CARE	ARBI	APPI	GOBI	ARBA
BOA	APL	AGOR	DOL	BOL	BREI	JALI	PAYA
PAC	BAD.DI	BALP	GOOL	NOSE	BRNO	NOBO	DETA
SEDO	CAR	CILO.DI	PAC	MIDE	CTI	ROBI	MIKA
NETO	CORP	CORP.DI	PASN	RIAL	PTI	ENBO	
TLL	COM.DI	COM.DI	PAS	ROBI	MABI		
	COM.DI	DOTI	VAR		SAGA		
	ONO	PTIC.DI			PTIC		
	DSE.DI	QEFF			SAVA		
	ANT.DI	PASA.DI			SALO		
	ACKI	TRAC			SEPO		
	MERI.DI	PURA			BEIT		
	ELPO.DI	BARO			ICE		
	TRCO	TRC			SAC		
	VARR	VINO.DI					
	BOO	NOBO.DI					

Picking:

.picks 898 bytes

ACOM BB 2 ? P ? 20090309 0749 56.3780 GJ

BAD SP_3 Z ? P ? 20090309 0749 54.7040 C

last modified: 2009-03-09 09:06

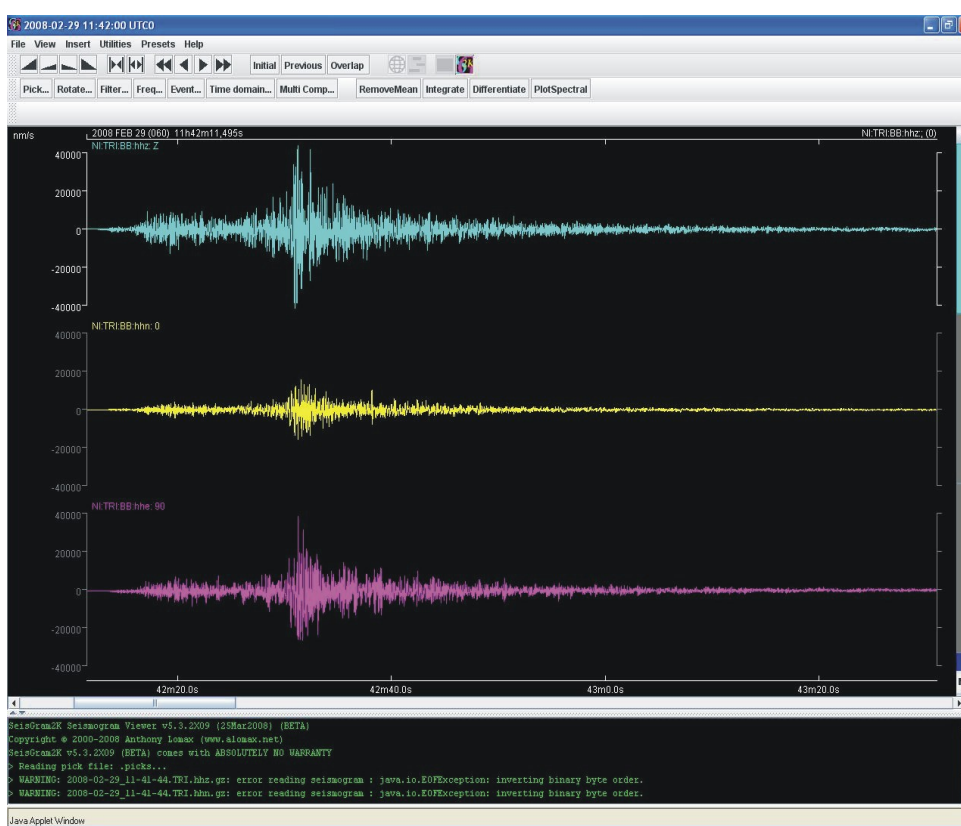
Hypocentral Location

event.blt ????? bytes

last updated: ???-??-?? ??:???

- Network selection
- Station selection
- Antelope automatic pick included
- Hypo71 localization
- Duration magnitude estimation

A. Lomax Seisgram2K Viewer



- direct reading of trace data files over the Internet
- interactive zooming, scaling, rotation and transformation of the seismograms
- time and amplitude picking
- animated, 3D particle motion visualization
- sending picks to a remote process or URL (cgi-bin, Java servlet, ...)
- Multi-component analysis tools (Polarisation analysis, vector operations, ...)



REGIONE DEL VENETO

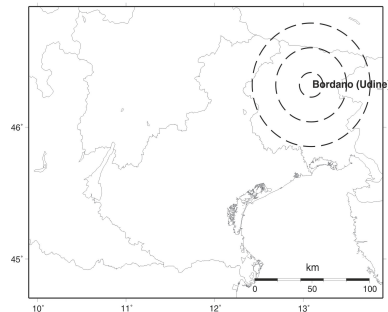


Centro Funzionale Decentrato Multirischi
Sala Operativa Tel. 041 2794012 Fax 041 2794019

SEGNALAZIONE DI TERREMOTO

Fax n.5394_1
Prima Segnalazione

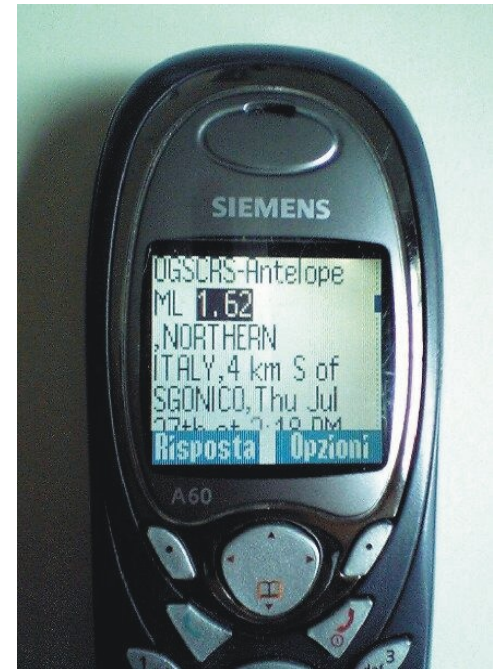
Evento n. 5394
del 29/02/2008 ore 12:42:00



Data: 29/02/2008	Epicentro: 46.317°lat (46°19'01")
Ora: 12:42:00 locale	13.090°lon(13°05'24")
Area: 1km WNW di Bordano (Udine)	Magnitudo: 3.7 (ML Richter)
	Profondità: 0.0 km

AVVERTENZA: localizzazione preliminare AUTOMATICA
dati soggetti a revisione da parte dei sismologi del CRS

Struttura responsabile dell'elaborazione dell'Avviso: OGS-CRS
Ist.Naz.Oceanografia e Geofisica Sperimentale-Dip.Centro Ricerche Sismologiche
Tel. 0432-522433/22 Fax 0432 522474
Reperibilità I 3358447150 Reperibilità II 3358447160 oppure 3297506060
Direttore CRS 320 4324734
Segnalazione pubblicata sul sito <http://www.crs.inogs.it>



Alert2:dbrecenteqs

CRS Home - Mozilla Firefox
File Modifica Visualizza Cronologia Segnalibri Strumenti 2
http://www.crs.ingv.it/ Google
Come iniziare Ultime notizie

Centro di Ricerche Sismologiche
cerca nel sito

Istituto Nazionale di Oceanografia e di Geofisica Sperimentale

Centro di Ricerche Sismologiche
Earthquake: NORTHERN ITALY

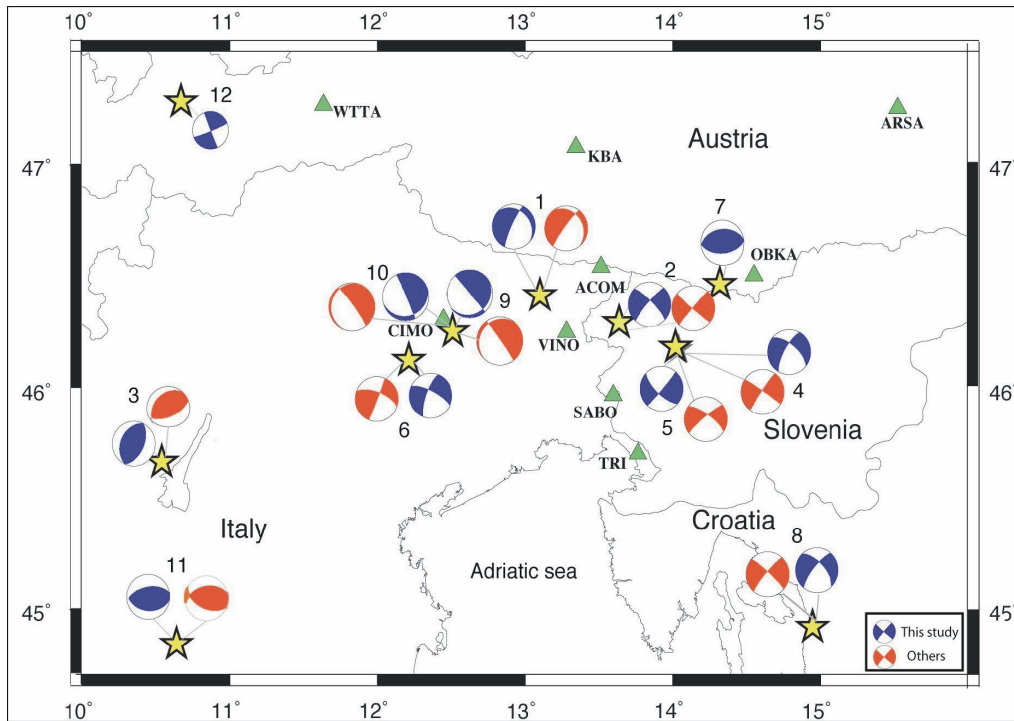
Savona
Alberga
Rapallo
Chiasso

Completato
start pier Desktop CorelDR 12 - L... Microsoft PowerP... Posta :: INBOX: T... CRS Home - Mozill... Download Acrobat Reader - ... 1.41

**Preferred
localization**

Alternative localizations

RT Analysis 1: moment tensor

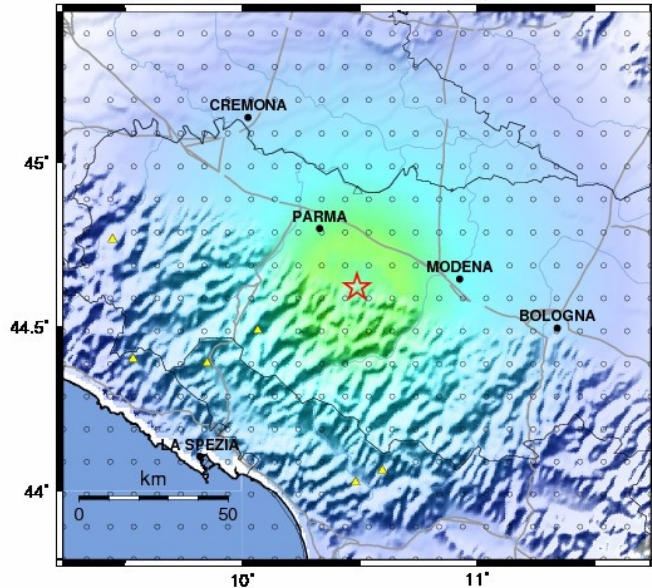


N	Date	Time	M_w
1	2002/02/14	03:18	4.7
2	2004/07/12	13:04	5.1
3	2004/11/24	22:59	4.8
4	2005/01/14	07:58	3.8
5	2005/01/14	08:05	3.6
6	2006/12/28	14:10	3.6
7	2007/01/01	14:59	3.8
8	2007/02/05	08:30	4.3
9	2007/02/26	05:50	3.8
10	2007/02/26	14:16	3.6
11	2007/05/09	06:03	3.9
12	2007/05/19	16:19	3.7

RT Analysis2: Shacking Maps

INGV ShakeMap : Zona_Reggio_Emilia

Tue Dec 23, 2008 04:24:20 PM MST M 5.2 N44.62 E10.49 Depth: 0.0km ID:2205007680

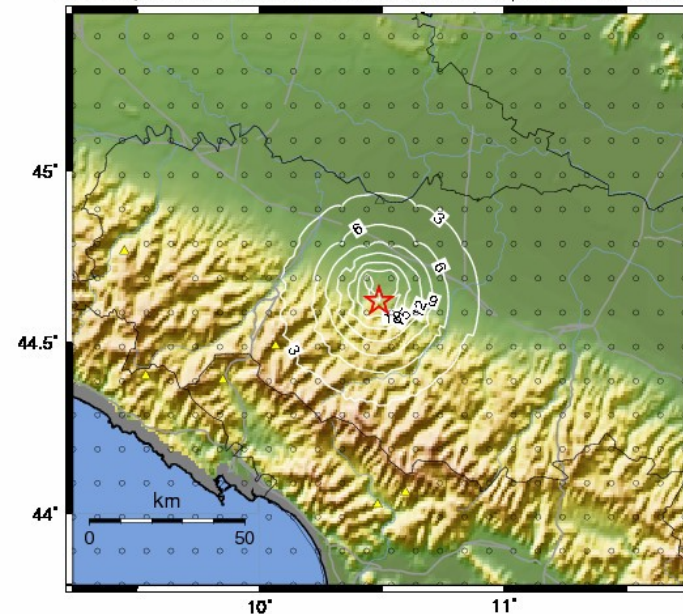


Map Version 1 Processed Mon Mar 2, 2009 03:17:42 PM MST, -- NOT REVIEWED BY HUMAN

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Vary strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Vary Heavy
PEAK ACC. [mg]	<.17	.17-1.4	1.4-3.9	3.9-8.2	8.2-18	18-34	34-85	85-124	>124
PEAK VEL. [cm/s]	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-18	18-31	31-60	60-118	>118
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

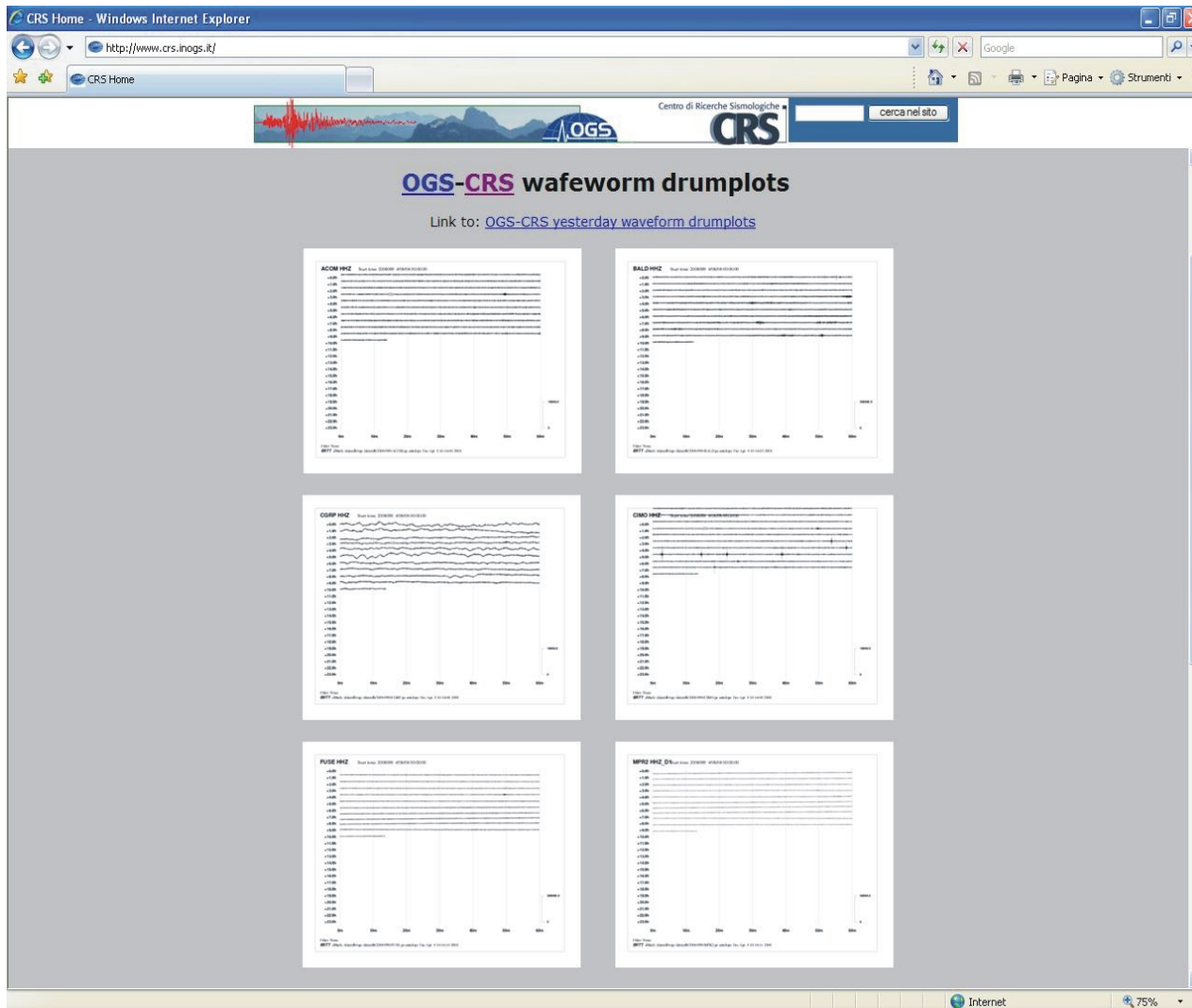
INGV Peak Accel. Map (in %) : Zona_Reggio_Emilia

Tue Dec 23, 2008 04:24:20 PM MST M 5.2 N44.62 E10.49 Depth: 0.0km ID:2205007680

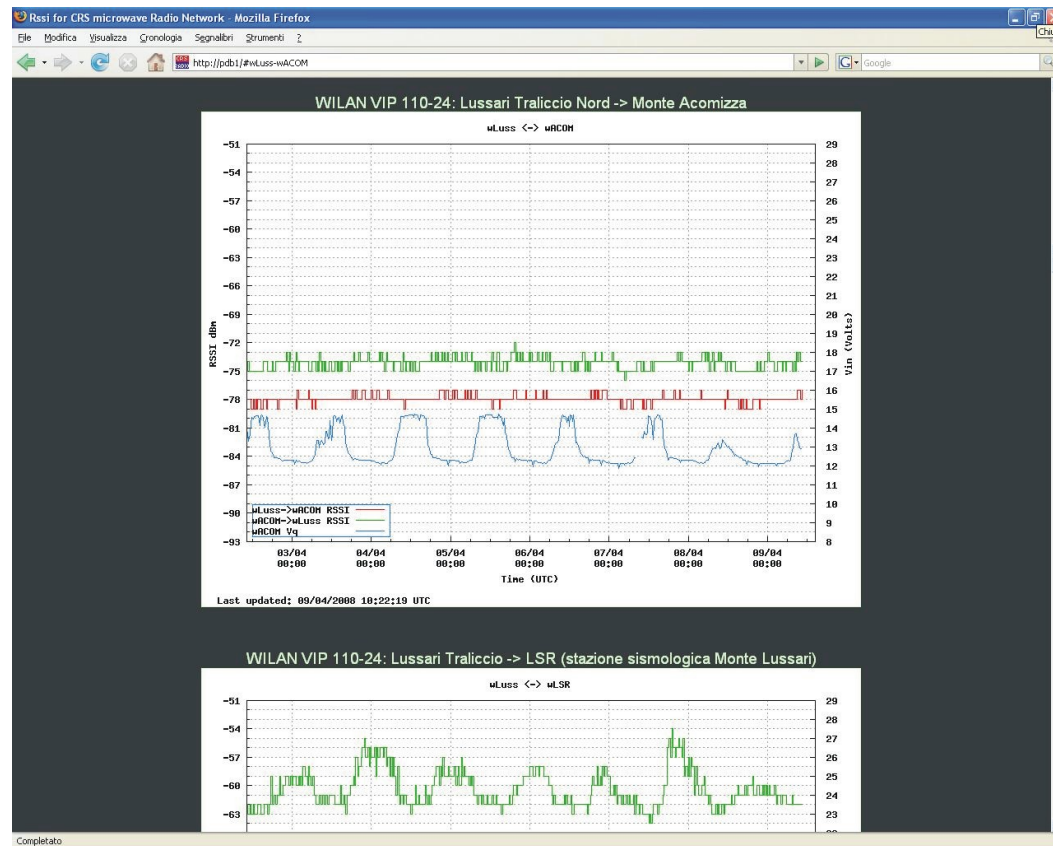


Map Version 1 Processed Mon Mar 2, 2009 03:17:42 PM MST, -- NOT REVIEWED BY HUMAN

SOH Monitoring 1: web dbheli



SOH Monitoring2: custom web plots



SOH Monitoring 3: web dlmon

Real-time Data Logger Monitor - Windows Internet Explorer

http://www.crs.inogs.it/antelope/webdlmon.htm

Real-time Data Logger Monitor

Centro di Ricerche Sismologiche

Real-time Data Logger Monitor

Mon Mar 9 15:11:18 2009

dlname	count	comp	pp24	nr24	pmp	SLT	dlfcy	runtm	tp	cnc	bufr	nl24	up24	nl24	dr	br24	br24	memc	nde	calc	dlfcy	lcq	cldrf	m0-2	m3-5	temp	volt	amp	gps3	pp3	pll	lat	lon	elev
W_BALP	0s	0				07s	100%	10m53s	75%	0	0	0K	66k	0	0	0K	66k	0	00s	100%	0us	20	-22	9C	12.8V	75mA	1D	L	45.683	10.819	1973m			
W_ACOM	0s	0				07s	02s	15m53s	92%	27	6.7k	6.6m	6.6m	0					00s	100%	0us	20	-17	9C	11.2V	91mA	3D	L	46.548	13.515	1796m			
W_AGOR	01s	26s				01s	26s	0-002m19s	3.4k										43s	1.00s	11	-5												
W_COSP	0s	0				07s	03s	33m43s	96%	24	5.5k	65m	6.8m	0					00s	100%	0us	20	36	2C	13.1V	88mA	2D	L	45.880	11.789	1836m			
W_COMO	01s	06s				01s	06s	44m53s	5.1k										44s	336ms														
W_LJNK	0s	0				07s	02s	37m48s	100%	24	8.4k	70m	6.8m	0					00s	100%	-2us	20	-12	12C	13.3V	74mA	3D	L	46.414	12.001	680m			
W_SABO	0s	0				07s	02s	12m47s	98%	24	6.2k	66m	6.7m	0					00s	99%	0us	21	-15	7C	13.7V	64mA	3D	T	45.307	13.634	631m			
W_VBRO	01s	04s				01s	04s	3d01k33m09s	6.1k										43s	1.00s														
W_ZOIG	0s	0				07s	03s	42m58s	100%	24	5.7k	61m	6.8m	0					00s	100%	0us	20	-9	8C	13.1V	85mA	3D	L	46.558	12.973	1978m			

Legend

dlname

Datalogger connectivity status:

- green - Currently connected and acquiring data
- cyan - Waiting for datalogger POC
- orange - Establishing a connection
- red - Sleeping after a connection setup failure
- magenta - Hibernating
- yellow - NULL datalogger ip-address
- gray - Stopped

runtm

- blue - Running time since current connection was established.
- red - Running time since connection has been down.

tp

Input & output data rate in bits per second.

lcq

Digitizer temperature.

cldrf

Digitizer voltage.

m0-2

GPS reported latitude.

m3-5

GPS reported longitude.

temp

GPS reported elevation.

gps3

GPS status:

Internet 75%

Orbassoc problem

- Big event ($M=5$) with many aftershocks within hours
- Orbassoc with P & S, very dense grid
- Orbassoc took 100% of CPU during the all sequence, delivering alarms very late (hours)
- We had to switch back to only P pickings and less dense grid

diverse

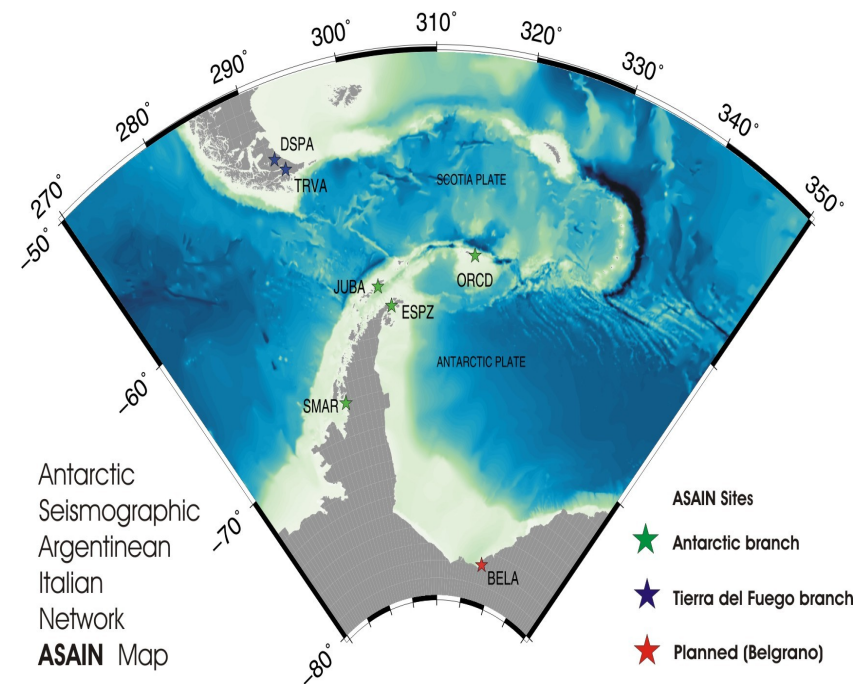
- New rtbackup 4.10 didn't work
- Wrote simple script starting from Taimi's rtbackup_wfdisc
- Replicating databases on diverse machines required rsync instead of orb2dbt -orbdbout because of local origin modification “non Antelope”
- Orb2orb still used for waveforms

Main Outstanding issues

- Orbassoc:
 - black box??
- Assistance:
 - european point of contact??
 - price
- Future: open/close system?
 - Data centers exchange
 - Dataloggers supported

ASAIN, GSN & Antelope

- EGU2009-12663
- Testing the global capabilities of the Antelope software suite: fast location and Mb determination of teleseismic events using the ASAIN and GSN seismic networks
- by D. Pesaresi et al.
- ASAIN - Antarctic Seismographic Argentinean Italian Network



31st Course of the INTERNATIONAL SCHOOL OF GEOPHYSICS | Director E. BOSCHI

5th 2009 Orfeus Co-ordination Meeting : International Workshop on Real Time Seismology: Rapid Characterization of the Earthquake Source and of its Effects

Erice, Italy
'Ettore Majorana' Foundation and Centre for Scientific Culture
2 May | 8 May 2009

Directors

A. Michelini, INGV, Rome, Italy | G. Selvaggi, INGV, Rome, Italy | T. Van Eck, ORFEUS, KNMI, De Bilt, The Netherlands | A. Rietbrock, University of Liverpool, UK | W. Hanka, GFZ, Potsdam, Germany | D. Wald, USGS, Golden CO, USA

General Information:

- [Committees](#)
- [Introduction and Aims](#)
- [Contacting with the Organization](#)

New Application Deadline -
2/15/2009

Download Workshop materials:

- [Initial Announcement](#) (.pdf 75 Kb)
- [Application form](#) (.pdf 27 Kb)
- [Arrival departure form](#) (.pdf 20 Kb)



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Istituto Nazionale di Geofisica e Vulcanologia (INGV), Rome, Italy
ORFEUS: Observatories and Research Facilities for European Seismology
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back to [INGV/Primo Piano](#)



31st Course of the International School of Geophysics
International Workshop on Real Time Seismology:
Rapid Characterization of the Earthquake Source and of its Effects
(EMFCSC, Erice, Sicily, 2-8 May, 2009)

- Scope of the Conference: This is an interdisciplinary workshop focussed on two main aspects of real time seismology: data acquisition, archiving and exchange, and scientific products from real time analyses. Since a decade, the quality growth of seismological networks allows for fast and accurate quantifications of earthquake source parameters and the estimation of the impact that the resulting strong ground motion has on the territory and the population. The aim of the workshop is to gather scientists and observatory operators working in real-time seismology to present and discuss the relevant standard analysis and the associated innovative research driven toward rapid determination of earthquake location, magnitude and moment tensor and ShakeMaps.
- Scientists from as varied subject areas as seismic network operation, seismology, earthquake engineering are invited to participate. Much emphasis is on didactic presentations which are thought to be optimal to foster future implementations at data analysis centres.
- The workshop is subdivided into two parts – general overview of methodologies and software (first three days – May 2-5), and specific software implementation for earthquake monitoring (EarthWorm and SeisComp3), and for ShakeMaps (last three days – May 5-8).