

Project S4

The Italian strong motion database

Coordinators: F. Pacor (INGV-MI)

R. Paolucci (Politecnico-MI)

Advisors from DPC: A. Gorini - A. De Sortis



INGV



1st semester evaluation by the International Evaluation Committee

Rome, INGV, Via Nizza, 128

November 20, 2008

Project S4

Research units

RU	Resp.
1: INGV-Milano Pavia	L. Luzi
2: INGV-Roma	G. Milana
3: Poli-Milano	R. Paolucci
4: Poli-Torino	S. Foti
5: Uni-Basilicata	M. Mucciarelli
6: Uni-Roma1	G. Lanzo
7: Uni-Siena	D. Albarello
8: GFZ - Postdam	S. Parolai

Project budget 420 k€

Background – Project S6 (2004-2006)

<http://esse6.mi.ingv.it>

S6: *Database of the Italian strong-motion data in the period 1972-2004*

Coordinators

L. Luzi (INGV) and F. Sabetta (DPC-SAPE)



ITalian ACcelerometric Archive

- [Interactive Database](#)
- [User Manual](#)
- [Disclaimer](#)
- [Send Comments](#)

In the framework of the agreement between INGV and DPC:

- Project S6 (2004-2006)
- Data base of the Italian Strong Motion Data (1972-2004) -
Coordinated by Lucia Luzi and Fabio Sabetta.
- Project S4 (2007-2009)
- Italian Strong Motion Data-Base -
Coordinated by Francesca Pacor and Roberto Paolucci.

Reference

If you use any record or parameter released by this site in a publication or report, please reference:
Working Group ITACA (2008) - Data Base of the Italian strong motion data: <http://itaca.mi.ingv.it>

S6 Project activities

1. Creation of the database structure
2. Waveform collection and processing
3. Revision of the seismic events, recording stations and instruments
4. Database implementation and data dissemination

ITACA – alpha version

ITACA (alpha version) includes:

- **2182** accelerograms from ENEL, ENEA and DPC, recorded in the period range **1972 – 2004** in the uncorrected version.
- Corrected acceleration, velocity and displacement time series, 5% acceleration response spectra and strong motion parameters, with the exception of noisy data.
- **1004** earthquakes with revised focal parameters (Magnitude, hypocenters, focal mechanisms and fault geometries)
- **616 recording-stations**: 351 operatives (232 digital and 119 analogue); 265 inoperatives from temporary networks and removed analogue instruments
- **Revised information about recording stations** (from station location to the evaluation of the site seismic response) and relative instruments
- **452** station reports

Project S4 (2007-2009) – Main goals

Operational activities

- Update ITACA data base (+ local networks + recent events)
- Integrate ITACA in the framework of the major strong motion databases in the world
- Implement a web-GIS interface, allowing the interactive exploration of geographical data and of the related attributes.
- Increase the number of stations with a quantitative description of Vs profile by low-cost (active or passive) geophysical investigations.
- Reduce the delay between event occurrence and availability of records.

Research activities and innovative features

- Identification and classification of “anomalous” sites and records
- Addition of new descriptive site parameters (e.g. f_0 , H , V_{sH}), to improve the reliability of site classification
- Improved methods for seismic classification at rock sites

Project S4 – Tasks

Task	Topic
1	ITACA update
2	Geological-geotechnical catalogue of ITACA sites
3	Site characterization by surface waves methods
4	Identification of anomalous sites and records
5	Seismic site classification

Project S4 – Interactions among Tasks

TASK2

Geological-geotechnical catalogue

TASK3

Geophysical survey at selected sites

TASK4

Anomalous sites and records
Data analysis
Monitoring
Numerical modelling

TASK5

Seismic site classification
Test new classificat.
GMPEs

Monographies

Vs profiles

Classification of anomalous sites

Site parameters
EC8 classification
Rock sites

TASK 1 – ITACA

Meetings

Plenary Project meetings

8th and 9th May in Milan: UR presentation and Activities coordination

30th and 31th October in Rome, work-progress check

Meetings with external experts

J. Stewart (UCLA, Los Angeles, California)

S. Akkar (METU, Ankara, Turkey)

D. Boore (USGS, Menlo Park, California)

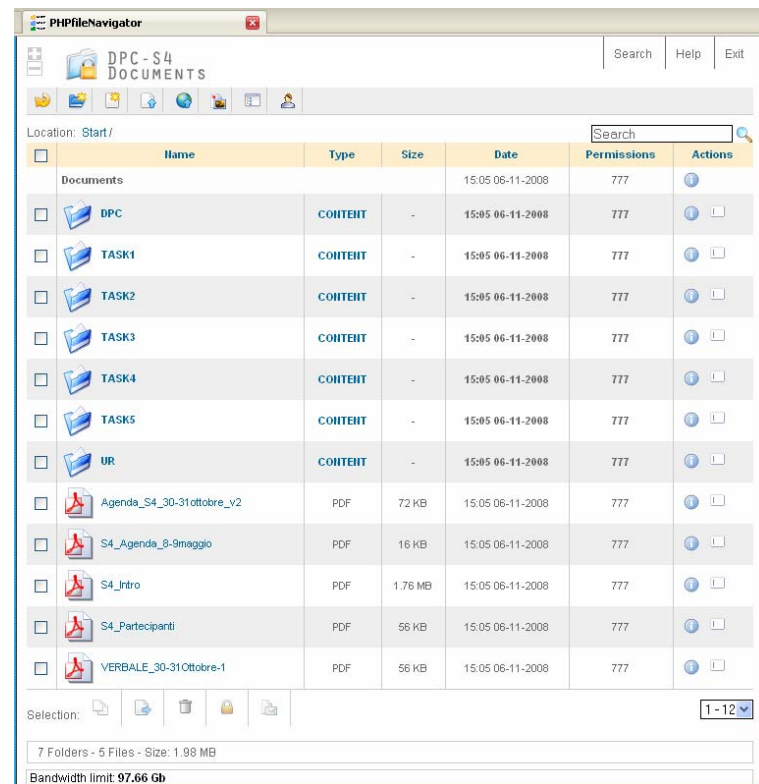
J. Douglas (BRGM, Orléans, France)

Conferences

MERCEA 08 - Reggio Calabria and Messina 8-11 July 2008;

1908-2008: Scienza e Società a cento anni dal grande terremoto, 10-12 Dicembre 2008, Reggio Calabria;

European Seismological Commission ESC 2008, 31st General Assembly, Crete, Crete, Greece, 7-12 September 2008



Web site: esse4.mi.ingv.it

TASK1 – ITACA (resp. Pacor – Paolucci)

The general aim of this task is to improve and update ITACA by increasing the number of strong motion data and to make it the reference database for Italian strong motion data.

D1 <i>Responsible</i> RU1-INGV-MI <i>Deadline</i> 4 m	Release beta-version of ITACA [ITACA v1.0b]	This release is the main product of project S6, within the 2005-07 DPC-INGV agreement, the robustness of which will be tested in the first few months of the project. The release will be progressively updated during the life time of the project.
D2 <i>Responsible</i> RU1-INGV-MI <i>Deadline</i> 24m	Final release of ITACA [ITACA v1.0]	This is the main final product of the project. It will be an up-to-date database integrated in the framework of the major strong-motion databases world wide.

Main activities

- a. Release of the “beta” version of ITACA [ITACA v1.0b], after accurate tests of the system efficiency and bugs check (Activities 1.1-1.5).
- b. Inclusion in ITACA of 2005-07 records from the RAN and collection of records from local networks and previous research projects and inclusion in ITACA (Activities 1.2, 1,3, 1.4).
- c. Implementation of the Web-GIS interface (Activity 1.6).
- d. Protocol for quasi real-time data transmission (Activity 1.8).
- e. Preparation of educational pages/Processing procedure (Activities 1.7 – 1.9).
- f. Integration of ITACA with other strong motion databases worldwide, (COSMOS, PEER, EMSC) (Activity 1.10).
- g. Investigation of the feasibility to include synthetic seismograms in ITACA database from large event and in outcropping condition (Activity 1.11).

ITACA – beta version (Activity 1.1 and 1.5)

Activity 1.1 - Deliverable D1 - [ITACA v1.0b]

The beta version of ITACA, i.e., the revised final product of the past Project S6, has been released

<http://itaca.mi.ingv.it/>



ITACA
Italian ACcelerometric Archive
[beta release]

- ▶ [Interactive Database](#)
- ▶ [User Manual \(PDF, 1.8M\)](#)
- ▶ [Disclaimer](#)
- ▶ [Send Comments](#)

In the framework of the agreement between INGV and DPC:

- ▶ Project S6 (2004-2006)
 - Data base of the Italian Strong Motion Data (1972-2004) - Coordinated by Lucia Luzi and Fabio Sabetta.
- ▶ Project S4 (2007-2009)
 - Italian Strong Motion Data-Base - Coordinated by Francesca Pacor and Roberto Paolucci, DPC Advisors: Antonella Gorini and Adriano De Sortis

Reference
If you use any record or parameter released by this site in a publication or report, please reference:
Working Group ITACA (2008) - Data Base of the Italian strong motion data: <http://itaca.mi.ingv.it>

Riferimento bibliografico
L'uso dei contenuti di questa banca dati in una pubblicazione o in un rapporto scientifico, deve essere citato come:
Working Group ITACA (2008) - Data Base of the Italian strong motion data: <http://itaca.mi.ingv.it>

Developed by @IMTeam for INGV Recommended Browser:  Last update 2008-10-13

ITACA

Italian ACcelerometric Archive

[beta release]

ITACA – beta version

2008, April 8 Meeting at Milan with DPC advisors to discuss the bugs and the main adjustments of ITACA (alpha version) coming also from tests of the system efficiency (Activity 1.5)

The main modifications refer to:

Server

ITACA was installed on a new server (with statistical on the accesses)

Database interface

Waveform plots - Progressive search – Queries – download files

Station and instrumental information

ENEL database was recovered and used to integrate ITACA tables

Check of station coordinates, address, housing

Add Start and End operation time (update to 2007)

Bugs correction

ITACA – beta version: structure

The database structure is not changed

ITACA beta version is installed on INGV server located at INGV-MI

Statistics

Monthly history

Days of month, weeks, hour

Visitors

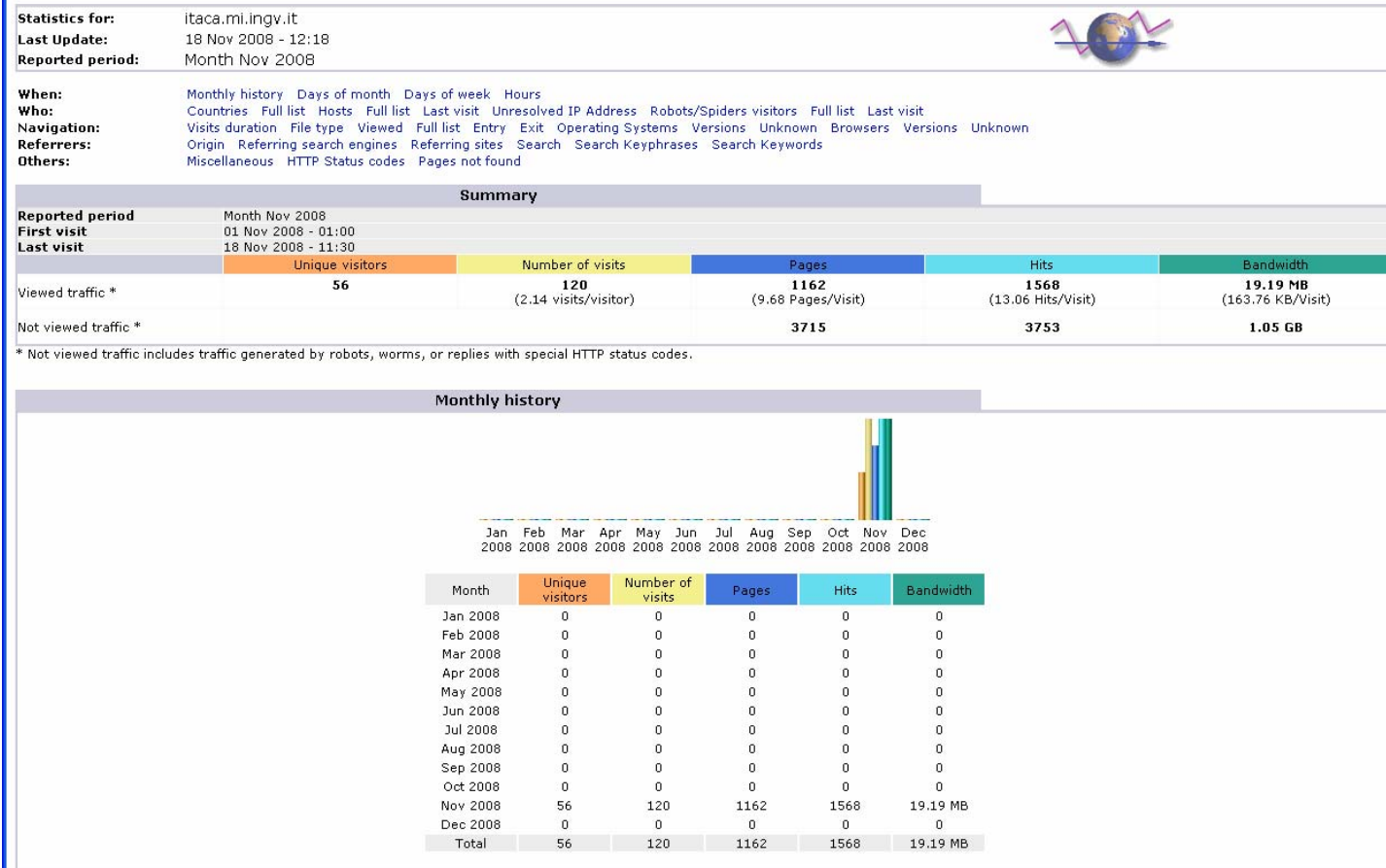
domains/countries

Host – Robots

Operating system, browser









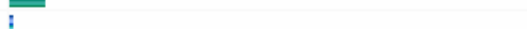



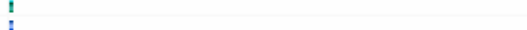

Connect to site from

Search keyphrases



ITACA – beta version: statistics

Visitors domains/countries (Top 10) - [Full list](#)

Domains/Countries		Pages	Hits	Bandwidth	
 Italy	it	812	1014	10.92 MB	
 United Kingdom	uk	161	178	2.51 MB	
? Unknown	ip	151	304	5.02 MB	
 Germany	de	33	67	760.99 KB	
 Greece	gr	2	2	432 Bytes	
 Commercial	com	2	2	864 Bytes	
 Network	net	1	1	432 Bytes	
Others		0	0	0	

Connect to site from

Origin	Pages	Percent	Hits	Percent
Direct address / Bookmarks	324	89.7 %	324	89.7 %
Links from a NewsGroup				
Links from an Internet Search Engine - Full list				
- Google 10 10	10	2.7 %	10	2.7 %
Links from an external page (other web sites except search engines) - Full list	27	7.4 %	27	7.4 %
- http://www.ingv.it/servizi-e-risorse/banche-dati 13 13				
- http://www.ingv.it/servizi-e-risorse/banche-dati/ 11 11				
- http://srl.geoscienceworld.org/cgi/content/full/79/5/716 2 2				
- http://www.seismosoc.org/publications/SRL/SRL_79/sr_79-5_luzi_e... 1 1				
Unknown Origin				

Search Keyphrases (Top 10)

[Full list](#)

7 different keyphrases	Search	Percent
itaca ingv	3	30 %
ingv itaca	2	20 %
itaca database	1	10 %
itaca strong motion	1	10 %
francesca pacor ingv - mi	1	10 %
itaca db	1	10 %
s4 progetto itaca	1	10 %

Search Keywords (Top 10)

[Full list](#)

12 different keywords	Search	Percent
itaca	9	36 %
ingv	6	24 %
s4	1	4 %
db	1	4 %
strong	1	4 %
progetto	1	4 %
database	1	4 %
-	1	4 %
francesca	1	4 %
motion	1	4 %
Other words	2	8 %

ITACA – beta version: Data collection

The number of waveforms, stations and events is not changed.

Information about stations were revised and/or added

2182 3-component waveforms (from analogue and digital instruments) relative to **1004** earthquakes

Stazioni: **616** recording stations

operative

203 digital and **129 analogue (DPC-ENEA Networks)**

inoperative

284 temporary networks and removed analogue instruments

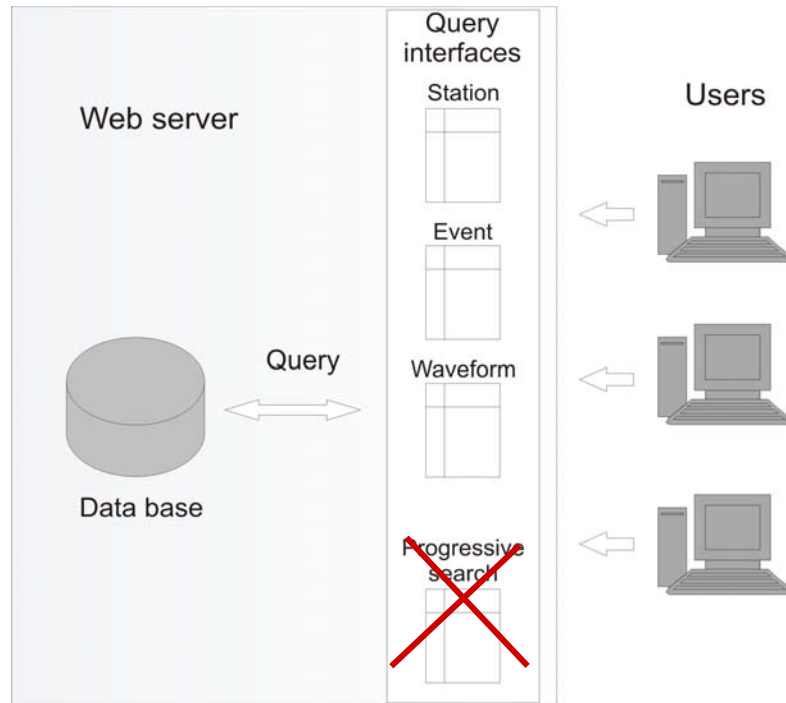
Revised station data: Start – End time; coordinates; address; housing using SOGIN and DPC data-base

ITACA – beta version: queries

Web database: <http://itaca.mi.ingv.it>

The query pages were modified in order to simplify the waveform search.

The plotting of waveforms and spectra were modified in order to reduce the time-visualization



The database can be explored through **29** key fields: **9** for the stations, **10** for the seismic events and **10** for the waveforms.

Each query produces a list of outcomes which can be explored in detail

Waveforms search

http://itaca.mi.ingv.it/ItacaNet/CadmoDriver

Homepage Waveforms Stations Events Reference

Waveforms Search

Waveform click to show-hide

Magnitude (M_L) from [≥]: 5 to [<]: 6

Epical distance [Km] from [≥]: to [<]:

Fault distance [km] from [≥]: to [<]:

PGA [cm/s²] from [≥]: to [<]:

Uncorrected PGA [cm/s²] from [≥]: to [<]:

PGV [cm/s] from [≥]: to [<]:

PGD [cm] from [≥]: to [<]:

Duration [s] from [≥]: to [<]:

Arias intensity [cm/s] from [≥]: to [<]:

Events click to show-hide

Stations click to show-hide

Network contains - Any value -

Station Code contains CLF

Station Name contains

Latitude (e.g. 45.27) from [≥]: to [<]:

Longitude (e.g. 12.7) from [≥]: to [<]:

Region contains

Province contains

Municipality contains

EC8 contains

Housing contains - Any value -

```
{ ( ( mag_value >= 5 ) AND ( mag_value < 6 ) ) AND ( EXISTS ( SELECT * FROM STATION WHERE ( ( UPPER( station.station_code ) LIKE UPPER( '%CLF%' ) ) AND ( v_waveform_magnitude.net_code = station.net_code ) ) AND ( v_waveform_magnitude.station_code = station.station_code ) ) ) ) }
```

Search New Search

Date	M _L	Stat. Code	R. epi. [km]	PGA [cm/s ²]	PGV [cm/s]	Detail
1997-09-26 00:33:12	5.6	CLF	2.8	338.1556	20.875	
1997-09-26 09:40:25	5.8	CLF	5.9	197.7861	17.3378	
1997-10-03 08:55:22	5.0	CLF	7.8	118.3068	-8.0132	
1997-10-06 23:24:53	5.4	CLF	6.1	116.0258	11.4428	
1997-10-14 15:23:09	5.5	CLF	15.4	87.8335	-7.0537	
1997-10-12 11:08:36	5.1	CLF	14.4	44.9286	-1.8299	

Developed by IMteam for INGV

Query visualization

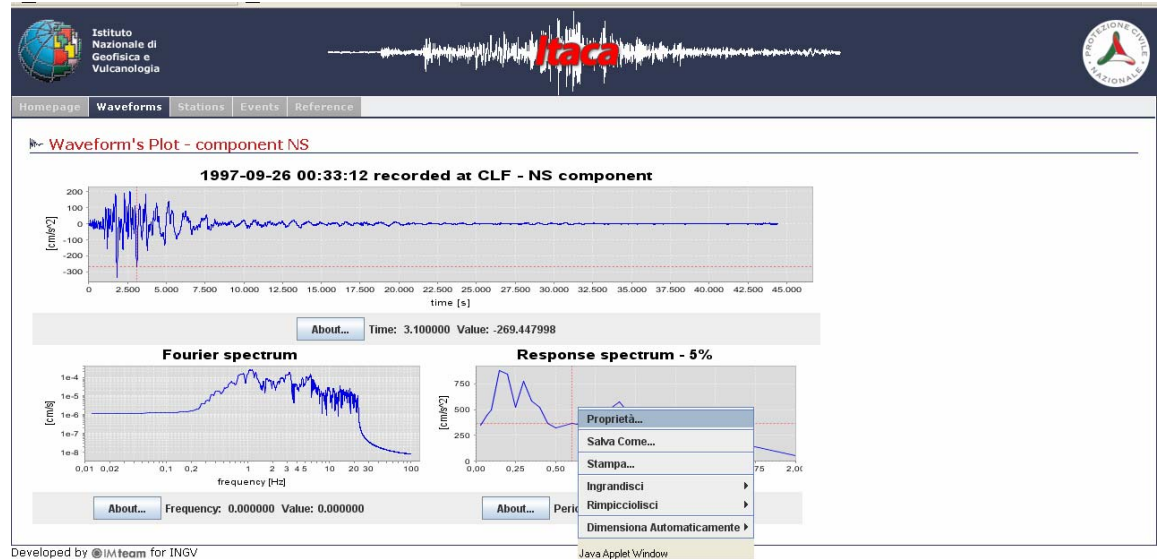
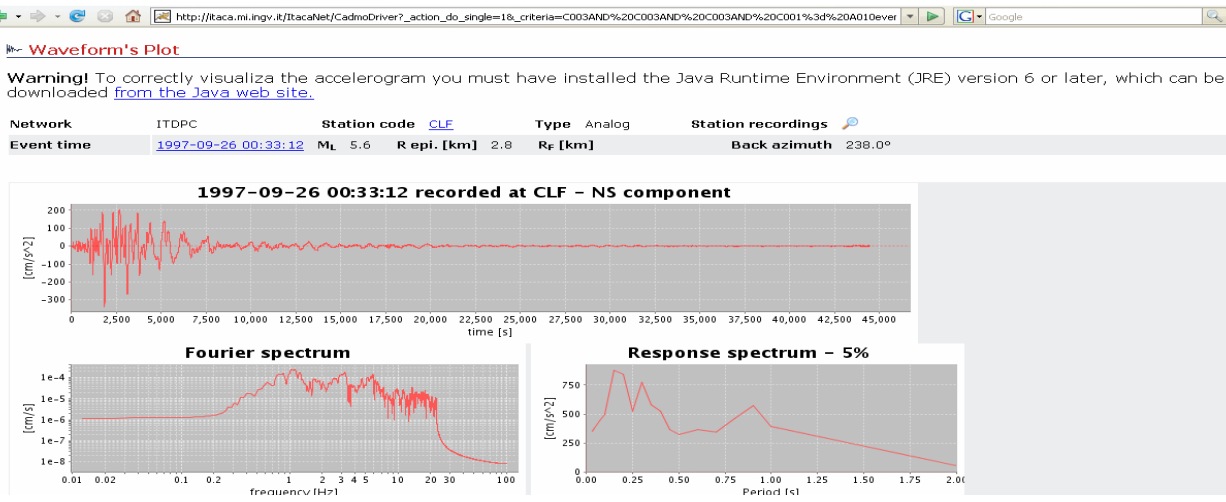
Link to event and station

Waveform detail

Waveforms plot

Static images

Java applet



Station search

The screenshot shows the 'Itaca - Stations search' web application. The interface includes a search form with the following fields:

- Network: - Any value -
- Station Code: contains []
- Station Name: contains colfiorito
- Latitude (e.g. 45.27): from [] to []
- Longitude (e.g. 12.7): from [] to []
- Region: contains []
- Province: contains []
- Housing: - Any value -
- Number of Recordings: contains []

A 'Search' button is located below the form. The results table is as follows:

Network	Stat. Code	Station Name	Latitude	Longitude	Municipality	EC8	Instr. type	Housing	# of records	Station recordings
ITDPC	CLC	COLFIORITO CASERMETTE	43.029388	12.891277	FOLIGNO	n.a.	Digital	Building	123	
ITDPC	CLF	COLFIORITO	43.035898	12.920538	SERRAVALLE DI CHIANTI	n.a.	Analog	ENEL Box	25	

At the bottom left, it says 'Developed by IMteam for INGV'. Two blue arrows point from the text 'Station detail' to the 'CLC' and 'CLF' links in the table. Another blue arrow points from the text 'Recordings detail' to the magnifying glass icons in the 'Station recordings' column.

Station detail

Recordings detail

Station detail

http://itaca.mi.ingv.it/ItacaNet/CadmoDriver?_action_do_single=1&_criteria=C003AND%20C001%3d%20A006net_codeIA0011%27C001%3d%20

Itaca - Station detail

Istituto Nazionale di Geofisica e Vulcanologia

PROTEZIONE CIVILE NAZIONALE

Homepage Waveforms **Stations** Events Reference

Station detail

Network	ITDPC	Station Code	CLF
Station Name	COLFIORITO		
Instr. Type	Analog		
Lat	43.035898	Long	12.920538
Elev [m.a.s.l.]	753	EC8 Code	under construction
		Projection Estimate	GEOWGS84 under construction

Map data ©2008 Tele Atlas. Termini e condizioni d'uso

Install. Date	1991-05-16 00:00:00	Removal date	2007-11-25
Address	CASONE Cabina di trasformazione MC-52-E-07		
Municipality	SERRAVALLE DI CHIENTI		
Proximity	No information		
Permanent	Permanent	Housing	ENEL Box
Installation	Pillar		
IGM sheet	123	Sector	II
Morphology	under construction		

Station report

Soil profile

Code	Reference	Latitude	Longitude	Nspt profile	Vs/Vp profile	Cu profile
1	Di Giulio et al. (2006)	43.020944	11.932786			

[Download station monography...](#)

[Search Again](#) [Station Recordings](#)

All records

Station recordings

Geofisica e Vulcanologia

Homepage | **Waveforms** | Stations | Events | Reference

Station recordings

Network ITDPC
Station Code [AQV](#)
Municipality
Station Name L'AQUILA - V. ATERNO - CENTRO VALLE
Instr. Type Digital
Latitude 42.377222
Longitude 13.343888

INSTRUMENTS

Instrument	Installed	Removed
0	2001-10-29 00:00:00	
		2001-10-29 00:00:00
		2001-05-15 00:00:00

Instrument detail

Instrument Detail

Network: ITDPC
 Station: [AQV](#) Station
 Sensor manufacturer: Kinemetrics
 Sensor model: EpiSensor FBA-3
 Digitizer manufacturer: Kinemetrics
 Digitizer model: Etna
 Instrument type: Digital
 Sensor serial number: 0
 Digitizer serial number: 0
 Installed: 1997-01-01 00:00:00
 Removed: 2001-05-15 00:00:00
 Samples per sec: 200.0
 Number of bits ADC:

CHANNEL	Orientation	Azimuth	Inclination	Sensitivity	Units sensitivity	Gain	Frequency [Hz]	Damping	Full scale	Detail
NG	0.0	0.0	2.5	V/g	52.5	0.65	1.0			
UP	0.0	90.0	2.5	V/g	51.0	0.65	1.0			
WE	90.0	0.0	2.5	V/g	51.0	0.65	1.0			

Latitude	Longitude	M _L	Depth [km]	I ₀	Detail
42.398200	13.2898700	5.5	7.3		
42.376000	13.246200	2.2	12.5		
42.405700	13.233700	3.4	0.1		
42.358500	13.596500	2.8	12.9		
42.379300	13.353500	2.8	16.4		
42.311000	13.299800	2.7	9.2		
42.394500	13.345800		7.4		
42.358000	13.050300		6.0		
42.212300	12.884800	2.1	13.4		
42.350300	13.209500	2.1	8.1		
42.353200	13.227800	2.1	8.1		
42.354500	13.229300	2.5	11.1		
42.336700	13.213700	1.9	6.5		
42.351800	13.225700	2.1	6.2		
42.4339700	13.212200	2.6	2.0		
42.4358700	13.237000	1.9	15.0		
42.4360300	13.232700	2.1	14.5		
42.4362300	13.233800	1.7	14.5		
42.4359700	13.234500	2.2	14.0		
42.4361000	13.221800	2.0	11.2		
42.435300	13.288300	2.7	14.5		

Note

Export in Zip file

Corrected records (only corrected time histories and response spectra) - ascii format

Event search

The screenshot shows the Itaca Events Search web application. The browser address bar displays `http://itaca.mi.ingv.it/ItacaNet/CadmoDriver`. The page header includes the logo of the Istituto Nazionale di Geofisica e Vulcanologia (INGV) and the logo of the Protezione Civile Nazionale. The main navigation menu contains links for **Homepage**, **Waveforms**, **Stations**, **Events**, and **Reference**. The **Events** section is active, showing the **Events Search** form.

The search form includes the following fields:

- Date (YYYY-MM-DD)**: from [≥]: to [<]:
- Event name**: contains
- Latitude (e.g. 45.27)**: from [≥]: to [<]:
- Longitude (e.g. 12.7)**: from [≥]: to [<]:
- Epicentral intensity**: from [≥]: to [<]:
- Hypocentral depth [km]**: from [≥]: to [<]:
- Focal mechanism**:
- Region**: contains
- Province**: contains
- Magnitude (any type)**: >=

A **Search** button is located below the form. The search results are displayed in a table with the following columns: **Event (click for details)**, **Event name**, **Latitude**, **Longitude**, **M_L**, **Depth [km]**, and **I₀**.

Event (click for details)	Event name	Latitude	Longitude	M _L	Depth [km]	I ₀
1997-09-26 00:33:12	UMBRIA-MARCHE 1ST SHOCK	43.023	12.891	5.6	3.5	8.5
1997-09-26 09:40:25	UMBRIA-MARCHE 2ND SHOCK	43.015	12.854	5.8	9.9	8.5
1997-10-14 15:23:09	UMBRIA-MARCHE 3RD SHOCK	42.898	12.899	5.5	7.3	

Developed by DIMteam for INGV

Event detail

Event detail

http://itaca.mi.ingv.it/ItacaNet/CadmoDriver?_action_do_single=1&_criteria=C001%3d%20A010event_timeIA0191997%2d09%2d26%2000%3

Itaca - Waveform's Plot Itaca - Event Detail

Event Detail

Date 1997-09-26 00:33:12 **Event name** UMBRIA-MARCHE 1ST SHOCK

Lat 43.02 ± 0.1km **Long** 12.89 ± 0.1km **Depth [km]** 3.51 ± 0.4

Hypocenter reference [CSI1.1](#) **Other hypocenter** [CPT104](#)

MAGNITUDE		Reference	Value	Error
Type	Method			
Mb	Mb from ISC Bulletin	ISC	5.5	
ML	Local-Magnitude scale from Synthetic Wood Anderson Seismograms	CSI1.1	5.6	
MS	MS from ISC Bulletin	ISC	5.6	
Mw	Mw from Global CMT	Global CMT Catalog	5.7	

Municipality SERRAVALLE DI CHIANTI **Province** Macerata

Focal Mechanism

Type	NF	Method	CMT	ref.	Pondrelli et al. (2006)
Strike	148.0	Dip	40.0	Rake	277.0
Fault	Yes	Surf. Rupt.	No	ref.	DISS3.0.2
Other faults					
I₀	8.5	Other I₀		ref.	ING Catalogue
Located	Location OK				

WAVEFORMS Station	R repi. [km]	PGA [cm/s ²]	PGV [cm/s]	Detail
AOK	86.1	6.4263	0.80726	
ASS	24.0	152.3222	5.8567	
BTT2	125.8	6.9721	-1.2823	
BVG	24.9	51.7692	4.0625	
CLF	2.8	338.1556	20.875	

Download data

Municipality SERRAVALLE **Province** Macerata
DI CHIENTI

Focal Mechanism

Type	NF	Method	CMT	ref.	Pondrelli et al. (2006)
Strike	148.0	Dip	40.0	Rake	277.0
Fault	Yes	Surf. Rupt.	No	ref.	DISS3_0.2

Other faults

I₀	8.5	Other I₀		ref.	ING Catalogue
----------------------	-----	----------------------------	--	-------------	-------------------------------

Located Location OK

WAVEFORMS

Station	R epi. [km]	PGA [cm/s ²]	PGV [cm/s]	Detail
AQK	86.1	6.4263	0.80726	
ASS	24.0	152.3222	5.8567	
BIT2	125.8	6.9721	-1.2823	
BYG	24.9	51.7692	4.0625	
CLF	2.8	338.1556	20.875	
CSA	24.5	98.4763	-6.9074	
CSC	35.2	29.0004	1.3109	
FHC	39.0	64.6167	1.8846	
GBP	40.6	34.1167	-3.2613	
LNS	51.5	25.9908	1.2201	
MNF	24.3	24.3966	-0.90334	
MTL	26.9	48.6305	-1.7815	
NCR	13.1	465.7507	-21.0868	
RTI	66.1	25.4814	2.0111	
SPM	35.4	47.9393	-1.625	

Export in Zip file

Corrected records (only corrected time histories and response spectra) - ascii format	
Uncorrected records (only acceleration time histories) - ascii and sac format	
Both corrected and uncorrected records - ascii format	

Search Again

Download data

Activities 1.2 – 1.3 – 1.4

Inclusion in ITACA of 2005-07 records from the RAN (National strong motion network – DPC owner)

The processing of accelerograms recorded in 2005 has started.

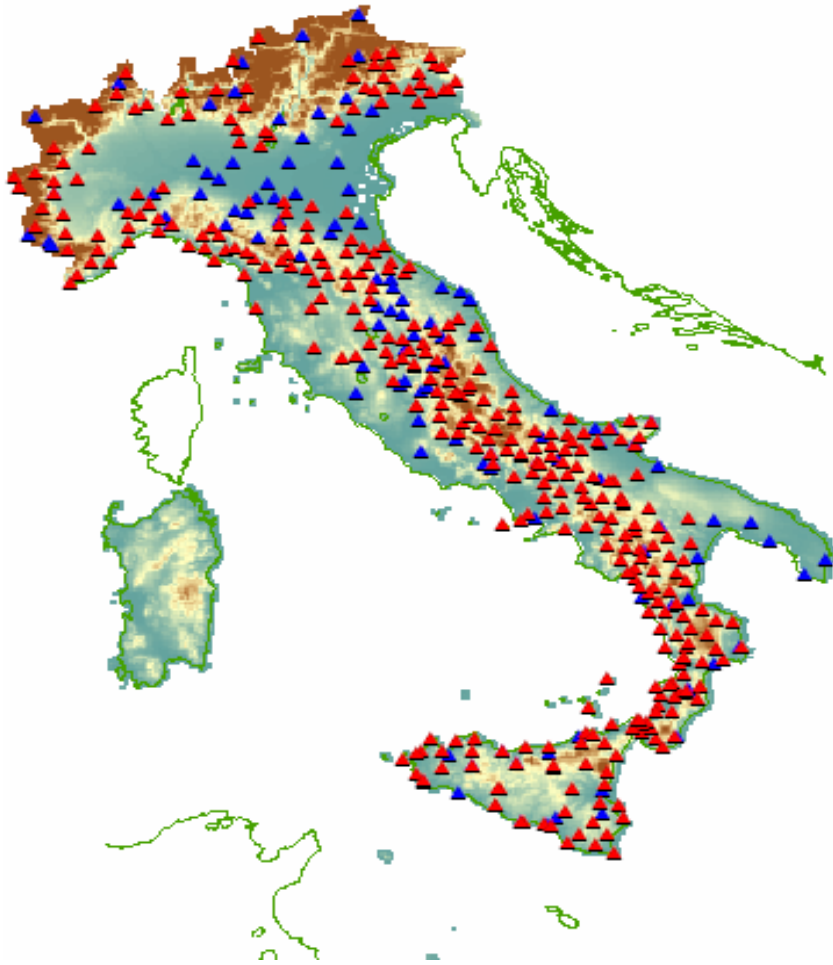
Collection of records from local networks and previous research projects and inclusion in ITACA

Information about local networks (# of stations, instruments, coordinates, etc.) has been collected.

The necessary agreements and formal letters for exchanging data have been sent to the managing authorities of local networks

Strong motion networks

RAN (National strong motion network)



Blue symbols: analogue stations

Red symbols: digital stations

RAN presently (July 2008) includes 365 stations distributed over the Italian territory:

→ 119 analogue remote stations of the original ENEL network, inside electric transformation cabins, to be upgraded to digital.

→ 246 digital stations, 237 with data transmission (GSM modems); 9 remote.

About 50 new digital stations and 1700 accelerograms have to be included

Strong motion networks

RAIS (INGV-Milano) **20**

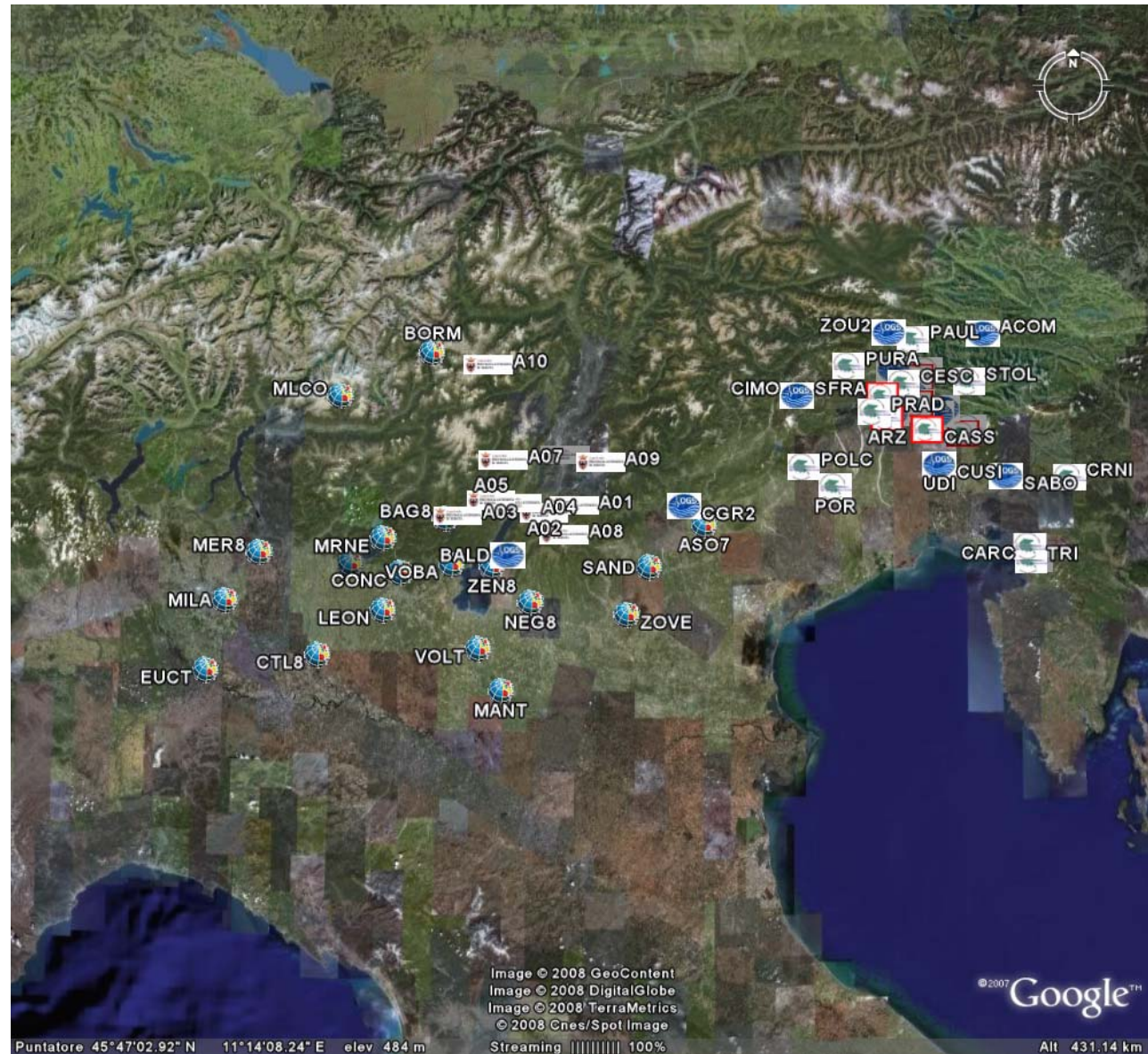
CRS (Udine) **15**

Trento Province **10**

RAF (Univ. Trieste)

Active **15**

Dismissed **10**



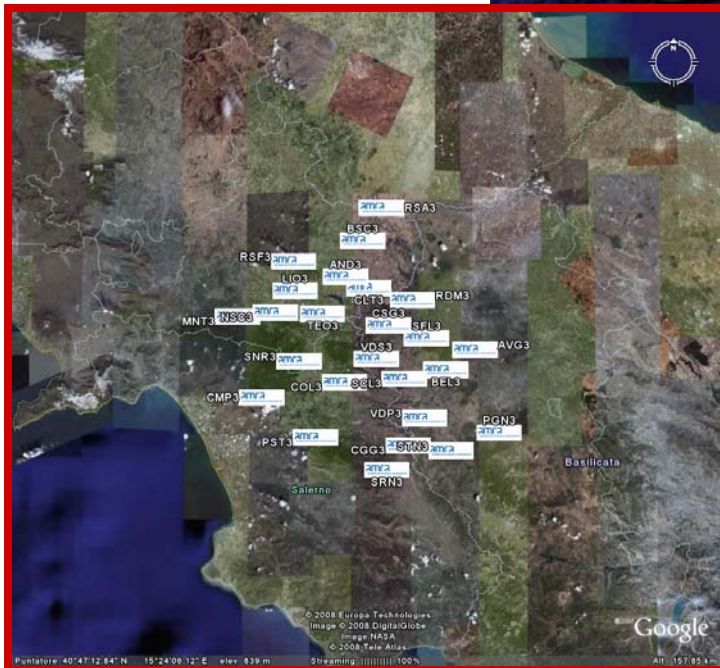
Strong motion networks

CNT (INGV)

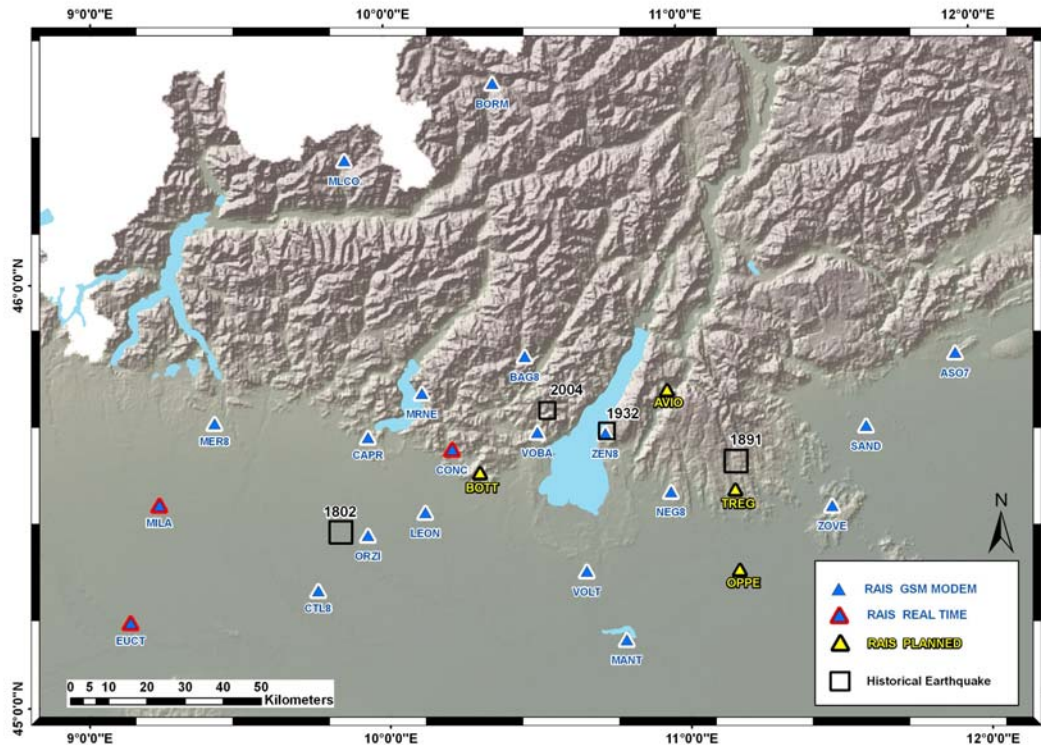
53

AMRA 25

(Campania region)



RAIS Strong Motion Network



RAIS Dataset
for ITACA
(ascii and mseed format)

Time Period
12.06.2006 → 13.11.2008
Epic. Distance < 250 km
M > 2.5

Number of stations: 20
Number of Eqs: 51

<http://rais.mi.ingv.it>

3-Comp Recordings 1059

Update 13.11.2008



Home

- Home
- Coordinators
- Co-workers
- Deliverables
- Project
- Utilities
- Station list
- Data exchange
- Documentation



Italian
Accelerometric
Archive

Login Form

Username

Project description

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Utente: esse4 Nome Completo: esse4 Ultima volta: Nov 12, 2008 at 03:39 pm

Informazioni sui Documenti

Nuovi:	0	Modificati:	0	Miei:	0	Gruppo:	0
Checked Out:	0	Monitorati:	(0:0)	Notizie:	0	Special Access:	(?:?)

Totale: 264

Ricerca Qualsiasi parola Cerca all'interno Cerca nella cartella corrente

Favoriti: NONE SELECTED

Download selezionati | Sposta selezionati | E-Mail selezionati | Elimina selezionati

Cartella corrente: Documents

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Titolo	Documento
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dati DPC <i>Cartella di dati accelerometrici 2004/2007</i>	Dati DPC ▶
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Itaca <i>In questa cartella sono presenti le versioni di rilascio di Itaca in formato mdb (Ms Access)</i>	Itaca ▶

- expected, either due to complex stratig
- interaction with man-made structures, s
- addition of new descriptive site parame
- classification.

Reserved web-site for data exchange

Retrieval of old data: Gemona recordings



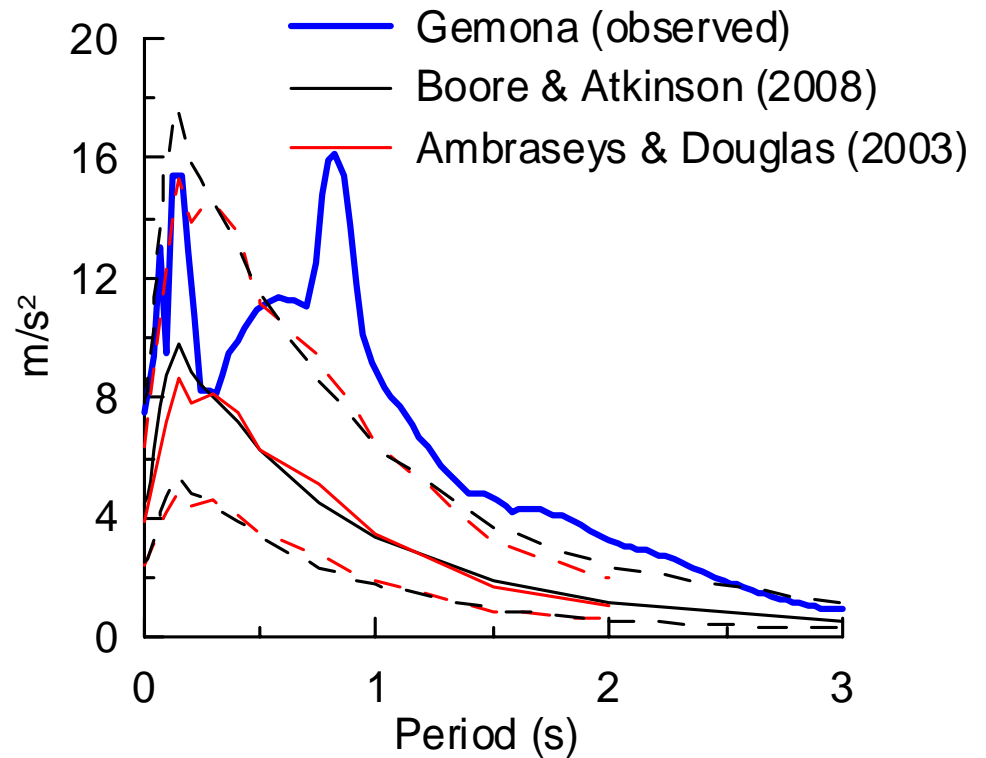
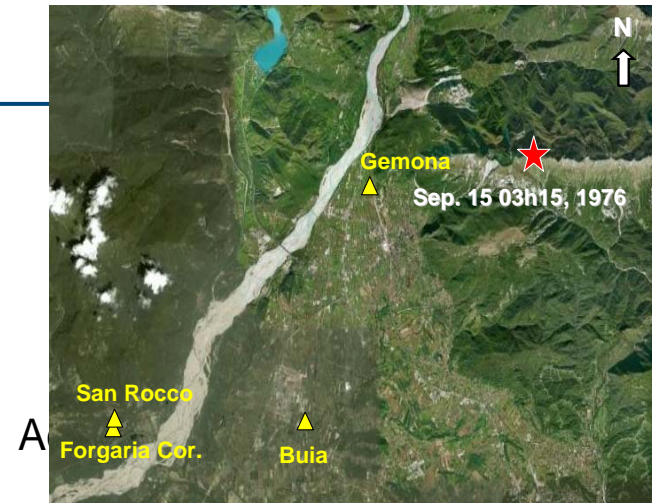
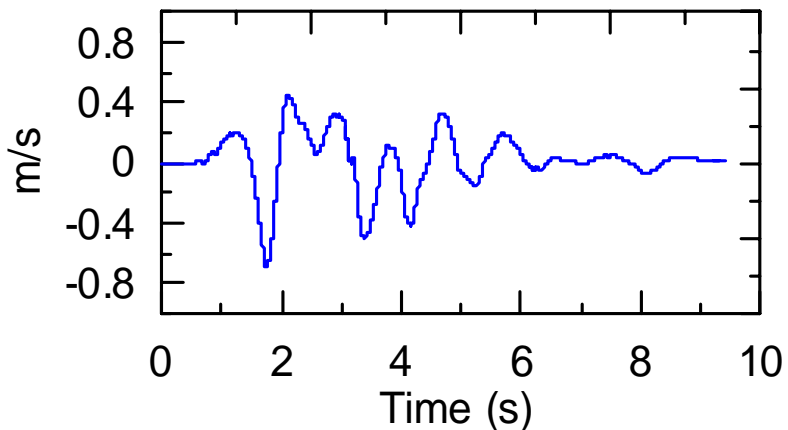
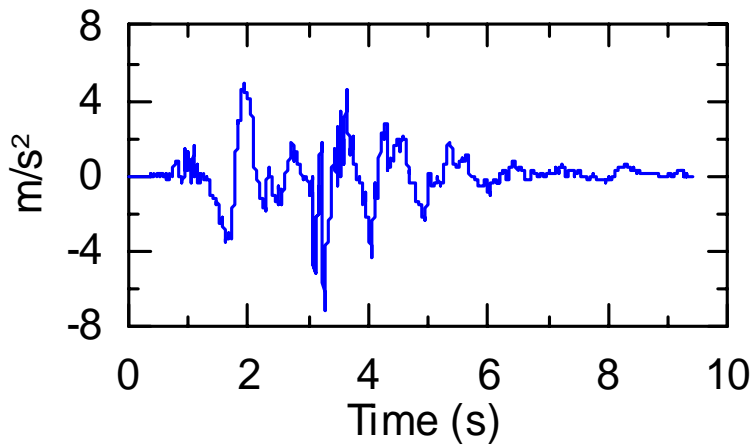
24 records with M_w from 4.0 to 5.9 and PGA up to 0.67g

Past data: Gemona recordings

Event #	Date (Time)	M _w	PGA [m/s ²]								
			EW	NS	UD						
1	08/06/1976 (12.14)	4,6	0,34	0,64	0,22	13	15/09/1976 (03.15)	5,9	2,98	6,76	5,04
2	17/06/1976 (14.28)	4,7	0,41	0,16	0,11	14	15/09/1976 (03.39)	4	0,19	0,26	0,17
3	26/06/1976 (11.13)	4,6	0,38	0,30	0,13	15	15/09/1976 (04.38)	4,9	0,98	1,06	0,72
4	07/09/1976 (11.08)	4,2	0,42	0,59	0,20	16	15/09/1976 (04.58)	4,8	0,68	0,99	0,57
5	11/09/1976 (16.31)	5,1	1,85	1,56	1,29	17	15/09/1976 (09.21)	5,9	2,50	2,63	2,89
6	11/09/1976 (16.35)	5,6	3,27	2,80	2,49	18	15/09/1976 (09.45)	4,6	0,51	0,32	0,23
7	12/09/1976 (16.48)	4,1	0,31	0,41	0,16	19	15/09/1976 (11.11)	4,8	0,90	0,70	0,64
8	12/09/1976 (01.20)	4,7	0,47	0,39	0,26	20	15/09/1976 (N.A.)	4,4	0,46	0,48	0,27
9	12/09/1976 (08.14)	4,6	0,53	0,55	0,20	21	15/09/1976 (19.31)	4,4	0,42	0,53	0,24
10	12/09/1976 (19.53)	4,9	0,55	0,47	0,29	22	15/09/1976 (20.24)	4	0,51	0,46	0,16
11	13/09/1976 (18.54)	4,6	1,22	1,90	0,52	23	15/09/1976 (N.A.)	4	0,63	0,64	0,44
12	13/09/1976 (19.42)	4,6	0,49	0,41	0,20	24	16/09/1976 (N.A.)	4,5	0,25	0,31	0,26

15/09/1976, 3h:15, M_w 5.9)

Gemona EW comp. M_w 5.9

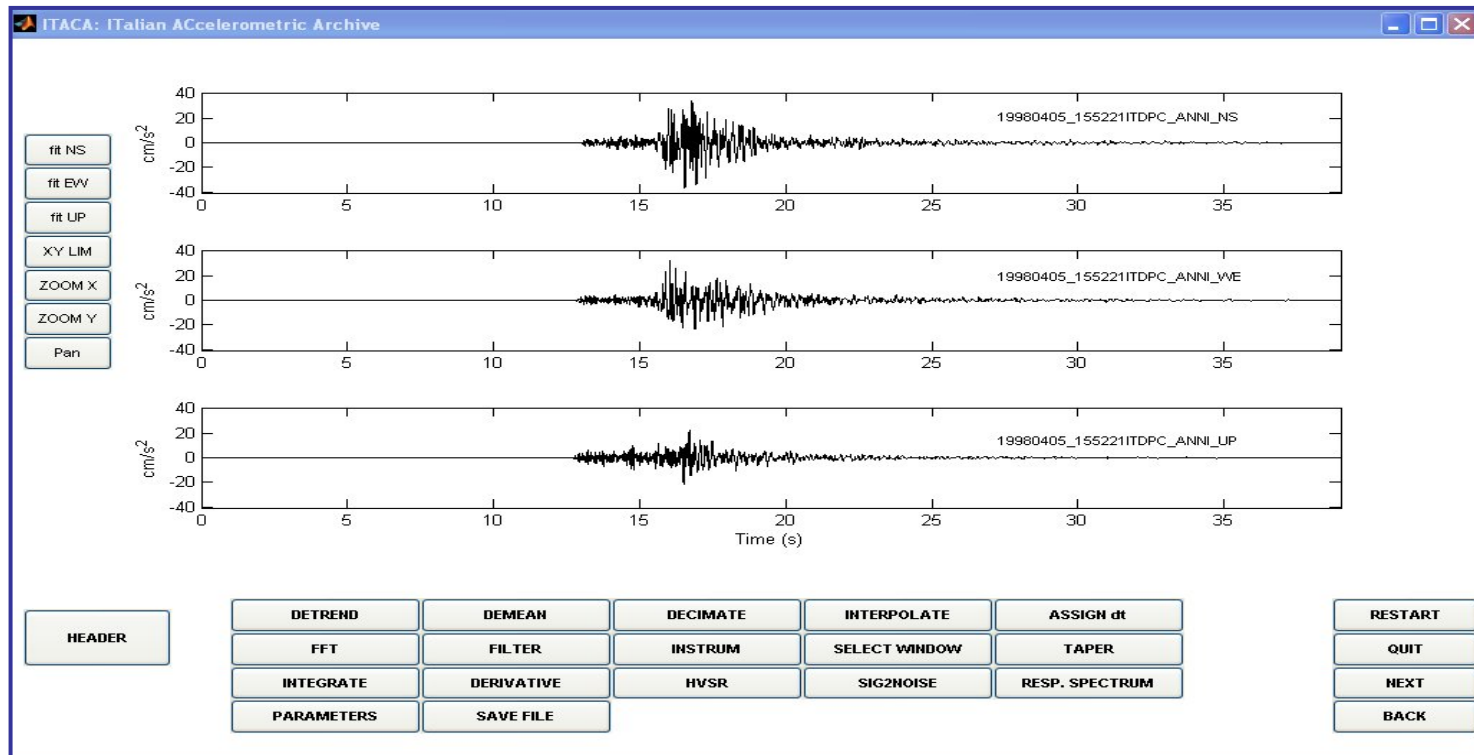


Data processing

Activity 1.7

Routines for data processing will be further improved and tested.

October: three meetings with Boore, Akkar and Douglas to discuss data processing and compare ITACA procedure with other ones.



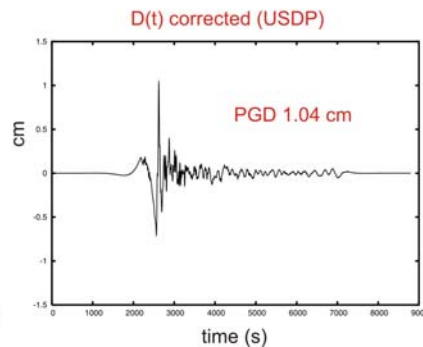
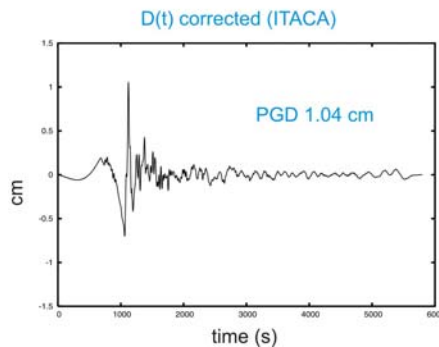
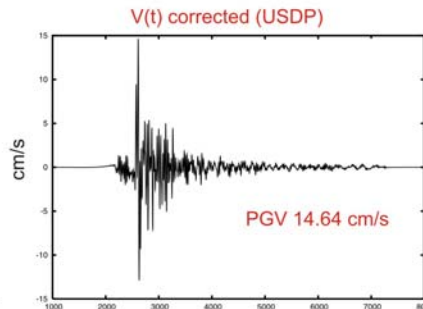
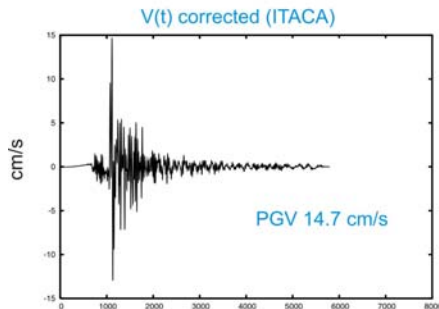
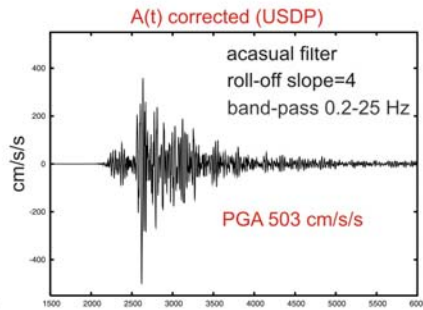
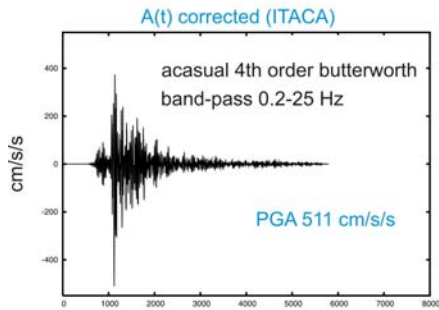
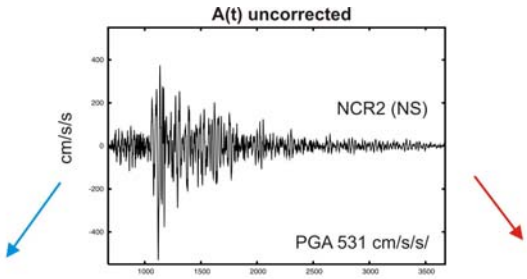
ITACA PROCESSING

Main features

- Applied to individual records, with the aim of obtaining physically reliable waveforms, also in displacement
- Applied to different data type (analogue/digital)
- Processed acceleration is integrated to obtain velocity and displacement
- Acceleration response spectra (5% damping) are calculated together with the main strong-motion parameters;

Computation detail

- Detrend: linear
- FFT: Matlab routine for fast Fourier transform
- Filter: acausal Butterworth and raised cosine
- Taper: cosine
- Integration and derivation: in the time domain
- Response spectrum: Duhamel integral



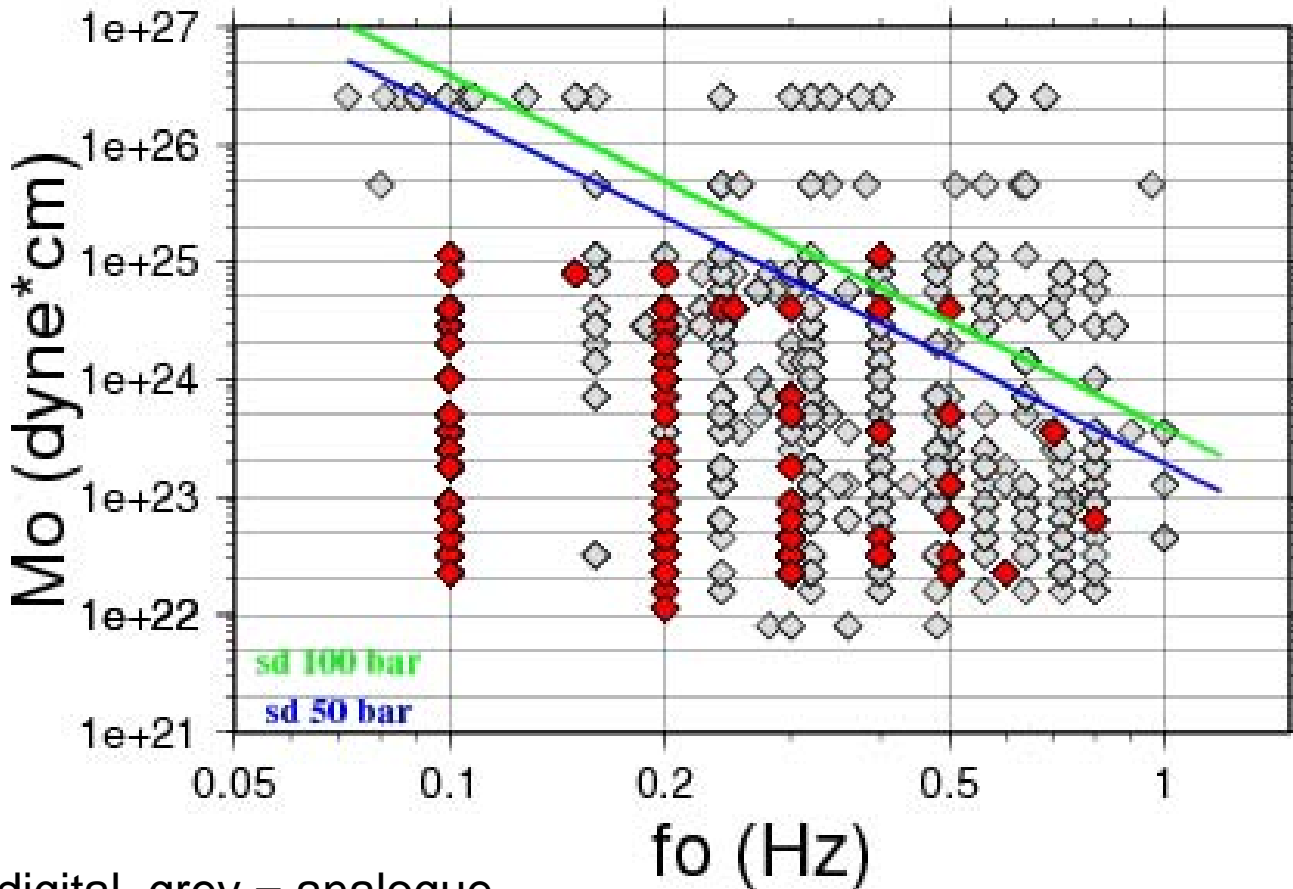
Comparison of ITACA and Akkar&Boore software

Similar acceleration, velocity and displacement peak values.

Different data padding

Band pass filters

Low-cut frequencies used in ITACA are too high?



Data processing

Planned activity

Check of cut-off frequencies selected for the main records
(tentatively $M_w > 5$) in ITACA

Re-processing of acceleration response spectra with denser
period sampling

Development of new routines for data processing

On-line publish the software for data processing and teaching
pages

New activities

To interface ITACA with REXEL: a software to search scaled real accelerograms compatible with target response spectra (e.g., Italian code (NTC 08) and EC8) with prescribed M, R and site conditions.

Presently, REXEL uses ESMDB strong motion records.

*ReLUIS
The Laboratories
University
Network of
seismic
engineering*

REXEL v 2.2 (beta)
Toolbox per la selezione automatica di accelerogrammi naturali per l'analisi dinamica non lineare delle strutture
Iunio Iervolino e Carmine Galasso, 2008
Dipartimento di Ingegneria Strutturale, Università di Napoli Federico II

1. Spettro target

Norme Tecniche per le Costruzioni
ag [g] 0.17
Longitudine sito [°] 14.191
Latitudine sito [°] 40.829
Visualizza sulla mappa

Categoria di sottosuolo A
Categoria topografica T1
Vita nominale 10 anni
Classe d'uso I
Stato Limite SLO (81 ...)

orizzontale verticale

Crea spettro di normativa Crea spettro arbitrario

2. Ricerca accelerogrammi

M minima 4.5 R minima [km] 0
M massima 5.5 R massima [km] 20

accelerogrammi: 162
eventi: 42

M = magnitudo momento (M > 4)
R = distanza epicentrale

Ricerca

3. Specifiche della selezione

Limite inferiore [%] 10
Limite superiore [%] 30
T1 [s] 0.15
T2 [s] 2

Adimensionali
Mi sento fortunato
(Stop alla prima combinazione trovata)

4. Ricerca combinazioni

1 componente
2 componenti
3 componenti

NUOVA RICERCA
ESCI

Task1 – Work progress



Completed



started on schedule



behind schedule

	1st year		2nd year	
	I	II	I	II
1. ITACA update				
Publication in the Web of ITACA beta version, after debugging	X			
Inclusion in ITACA of 2005-07 records from the RAN	X	X		
Collection of records from local networks and previous research projects and inclusion in ITACA	X	X	X	
Implementation of the Web-GIS interface	X	X		
Protocol for quasi real-time data transmission		X	X	
Preparation of educational pages/Processing procedure	X	X		
Test and debug of ITACA release 1.0			X	X

This task is going on schedule.

Problems

Delay in records collection from other networks

Link with other world data banks to be started now