



**Network of European Research Infrastructures for  
Earthquake Risk Assessment and Mitigation**

**Report**

**Dedicated acceleration network integration meeting:  
International workshop on Strong Motion and  
Acceleration data, 12-13 May 2014,  
Ankara, Turkey  
ORFEUS-NERA-AFAD workshop**

Activity:	<i>Networking accelerometric networks and SM data users</i>
Activity number:	<i>NA3, Task3.4</i>
Deliverable:	<i>Dedicated acceleration network integration meeting</i>
Deliverable number:	<i>D3.6</i>
Responsible activity leader:	<i>Sinan Akkar</i>
Responsible participant:	<i>KOERI</i>
Author:	<i>Sinan Akkar, Torild van Eck, John Clinton, Lucia Luzi</i>

**Seventh Framework**



---

**Programme**  
**EC project number: 262330**  
**Table of Contents**

Summary.....	2
I. Introduction.....	4
II. Workshop organization and aims.....	5
III. Main Conclusions of the Workshop.....	7
Appendix A: Questionnaire on data distribution.....	9
Appendix B: Workshop Program.....	10
Appendix C: List of Participants.....	12

## Summary

One of the major tasks in NERA-NA3 is to improve the networking among strong-motion data providers in the broader European region. This task also includes the efforts for increasing the interaction between the broadband and strong-motion community in the same region. To this end two international workshops were scheduled among the deliverables of NERA-NA3 work package. Organising the workshops within the ORFEUS ensured a broad community involvement.

The first workshop was held in 2012 in Istanbul, while the second one was held in May 2014 in Ankara. These workshops provided an excellent opportunity to introduce the ongoing efforts of the NERA-NA3 group members for establishing a long-term and sustainable infrastructure for the integration of European accelerometric networks for future research and professional activities.

This report summarizes the second Workshop activities as well as its major outcomes. Our Turkish host, AFAD, operates an extensive acceleration network within Turkey and is one of the larger acceleration data providers in and around Europe.

Also in this workshop the participants, most of them already members of the ORFEUS working Group on Strong Motion Data, ORFEUS WG5 ([www.orfeus-eu.org/workinggroups/wg5.html](http://www.orfeus-eu.org/workinggroups/wg5.html)), will continue the work on making data appropriately and on a large scale available.

## I. Introduction

The third work package (NA3) of the NERA project (Networking Accelerometric Networks and Strong-Motion Data Users) has among its aims structuring the relation between the accelerometric data providers and the end-users of accelerometric data. This objective is trying to be achieved through the development of infrastructures as well as through the networking of data providers.

### Infrastructures for accelerometric data

The main infrastructures for accelerometric data sharing and distribution are:

1) Rapid-Raw Strong Motion (RRSM): the first European system that automatically delivers strong motion products in near-realtime for earthquake scientists and earthquake engineers. The system collects and uses all relevant, unrestricted waveform data from the European Integrated waveform Data Archive (EIDA; [www.orfeus-eu.org/eida](http://www.orfeus-eu.org/eida)) within minutes after an earthquake ( $M \geq 3.5$ ) in the European- Mediterranean region. Earthquake information is automatically provided by the EMSC-CSEM ([www.emsc-csem.org](http://www.emsc-csem.org)). Waveform collection and processing are performed by 'scwfparam', a waveform parameterization module developed by ETHZ ([www.seiscomp3.org/doc/seattle/current/apps/scwfparam.html](http://www.seiscomp3.org/doc/seattle/current/apps/scwfparam.html)) and integrated in SeisComp3 ([www.seiscomp3.org](http://www.seiscomp3.org)). This waveform parameterization module computes peak ground acceleration (PGA), peak ground velocity (PGV), relative displacement elastic response spectrum (DRS) and pseudo absolute acceleration elastic response spectrum (PSA).

The RRSM web interface (<http://www.orfeus-eu.org/rrsm>), (developed at ODC, allows users to query earthquake information, peak ground motion parameters, response spectral amplitudes and to select and download earthquake waveforms within minutes after the earthquake. Current database contains data from 2005 to present.

2) Engineering Strong Motion database (ESM): engineering oriented database containing accelerograms recorded by the major Italian and Turkish strong-motion data providers, plus the data contained in the Internet-Site for European Strong-Motion Data (Ambraseys et al. 2002; [http://www.isesd.hi.is/ESD\\_Local/frameset.htm](http://www.isesd.hi.is/ESD_Local/frameset.htm)).

The earthquake and strong-motion metadata of ESM contains more detailed information than the corresponding metadata in RRSM, as almost all of the accelerograms in ESM are relative to events that are of engineering significance ( $M \geq 4$ ). The waveform parameterization and metadata information of such accelerometric data are processed in a different way for their use in engineering applications. The INGV and KOERI members in NERA-NA3 group assembled the data following the state-of-art procedures in metadata compilation and strong-motion data processing (i.e., waveform parameterization).

3) Station inventory: activity started in NERIES under the responsibility of EMSC and has been continued within NERA NA3 by the ODC (see deliverable D3.5).

## Networking of data providers

This deliverable provides describes an additional networking activity cumulating into the 2014 workshop in Ankara.

The first 2-year activities of the NERA-NA3 were shared with the strong-motion community of Europe and surrounding countries in the 2012 ORFEUS Observatory Coordination Workshop that was held in Istanbul, Turkey (Deliverable D3.3).

The major outcome of this first Workshop was the common agreement on the establishment of a working group (Working Group 5) operating under ORFEUS. The WG should be the basis of the sustainable integrated pan-European accelerometric databanks. Structuring the group under ORFEUS will benefit the future project opportunities supported by EPOS, as ORFEUS is the institution responsible of waveform data distribution in EPOS. The responsibilities and duties of the Work Group 5 are envisaged as follows:

- Setting rules for data dissemination
- MoU's between data providers (extending the Consortium)
- Collaborating with EPOS for the preparation of projects
- Contacting similar establishments in the other parts of the world
- Ensure quality of metadata and waveforms:
- Ensure IT development improvements:
- Data transfer, optimum data dissemination techniques etc
- Coordinate with related activities of ORFEUS/EPOS

## II. Workshop organization and aims

The last 2-year activities of the NERA-NA3 were shared with the strong-motion community of Europe and surrounding countries in the International workshop on strong-motion and acceleration data2014, held in Ankara in May 2014.

The Workshop was hosted by AFAD (Republic of Turkey Prime Ministry Disaster & Emergency Management Presidency) operator of one of the major acceleration networks in Europe and its surroundings. An additional reason to favor Turkey as a host was to ensure participation from countries in the region with large network, like Iran for example.

The workshop web site ([http://kyh.deprem.gov.tr/orfeus\\_2014/index.htm](http://kyh.deprem.gov.tr/orfeus_2014/index.htm)) contains the program, participants and all the presentations, thus publicly accessible.

The local organizers of the Workshop are as follows:

- Ulubey Çeken (AFAD, Turkey)
- Eren Tepeugur (AFAD, Turkey)

The members of international committee are:

- Torild van Eck (ORFEUS and KNMI, the Netherlands)
- Murat Nurlu (AFAD)
- Lucia Luzi (INGV, Italy)
- Sinan Akkar (KOERI, Turkey)

Two of the international committee members are also members of the NERA-NA3 work package (L. Luzi and S. Akkar), while Torild van Eck is the secretary general of ORFEUS. The program of the workshop and the list of participants are in Appendix A and B, respectively.

The objective of the workshop was to arrive at a consensus between acceleration networks in Europe and its surroundings on:

- a) facilitate integrated data access;
- b) update the regional strong motion data bases;
- c) establish a common data policy.

In preparing the workshop a questionnaire has been sent to each provider (Appendix A) with questions regarding data policy, in order to favor the discussion. This has been a starting point to prepare the next actions.

22 networks from 14 countries were represented. The results of the workshop were encouraging. Participants discovered the exchange of status of various networks, as rapid technological developments were carried out in few years. The discussions were open and included political as well as technical aspects on acceleration data management. The importance of establishing rules for data access, data use and re-use and the recognition and visibility of data providers was emphasized. Most important was that the discussions focused much on how to proceed to make data homogeneously available for research.

### **III. Main Conclusions of the Workshop**

The participants agreed on:

- Promote open (high quality) data access for the international research community, as indicated in the result of the questionnaire sent to each network (Figure 1);
- Appreciate priorities of civil protection and risk mitigation;
- Favor recognition and visibility of data providers in research products, through citation, acknowledgement and DOIs assigned to their infrastructures;
- Attribution of additional data value by data users (in particular researchers), thus facilitating long-term funding by local governments or the European community.

A series of practical actions were planned in order to continue with the data integration plan and support the long-term vision to create integrated services for a broad community of scientists and different stakeholders:

1) Widen European coordination, to facilitate data access and providers requirements, through the enlargement of the ORFEUS WG5 to the data providers willing to join the initiative.

2) Build on existing initiatives:

- make an inventory of what is available from data providers;

- enable data access or integrate with broader European services (e.g. EIDA);
- publish a preliminary version of the Engineering Strong motion database, that should integrate with existing databases;
- monitor access to data (and use and misuse of data) and learn from it (user feedback, statistics); establish a metric for the recognition of data providers in research products;
- organize one (or more) workshops to exchange technical experience; the first one should be organized within one year.

3) Work on a joint data access policy (licenses, restrictions, registration, etc.) and adopt shared and clear data policy to allow data redistribution.

4) Interact with parallel national scale developing processes.

## **References**

Ambraseys, N., Smit, P., Sigbjornsson, R., Suhadolc, P. and Margaris, B. (2002), Internet-Site for European Strong-Motion Data, European Commission, Research-Directorate General, Environment and Climate Programme.



Institute	METU	PUT	ICGC	KOERI	BHRC	IIEES	EURO-TestSite	NOAIG	ITSAK	INFP	ROB	SSS	INCERC	ZAMG	GEOFON	SED	IPMA	ARSO	INGV	ISNet	AFAD	DPC	RAP	%
Country	CY	AL	ES	TR	IR	IR	GR	GR	GR	RO	BE	RS	RO	AT	GE	CH	PT	SI	IT	IT	TR	IT	FR	
<b>1. Data format</b>																								
Continuous	1	1	1	1	0	0	1	1	1	1	0	1	0	1	1	1	1	0	1	0				70
Event triggered	1	1	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	1	1	1				60
SM parameters	1	0	0	1	0	0	1	1	1	1	1	1	1	0	0	1	0	0	1	0				55
<b>2. Time delay</b>																								
RT	1	0	1	1	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1	0				70
1 week	1	1	0	1	1	0	1	1	1	0	0	1	1	0	0	0	0	1	0	1				55
1 months	1	1	0	0	0	1	0	1	1	0	1	1	0	0	0	0	0	0	0	0				35
6 months	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0				10
<b>3. User identification</b>																								
No Identification	0	1	0	0	1	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0				25
Registration	1	0	1	1	0	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1			75
<b>4. Restrictions</b>																								
Research/academic	1	0	0	0	0	1	0	1	1	1	1	0	0	1	0	0	1	1	0	0				45
Governmental istit.	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	1	0	0	0				30
Professionals	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0				5
Private companies	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0				5
No restrictions	0	1	1	1	1	0	1	0	0	0	0	1	1	0	1	1	0	0	1	1				55
<b>5. Publishing /acnowlegments</b>																								
Citation	1		1	1		1	1	1	1	1	1	1	1	1			1		1	0				70
DOI	1							1	1						1			1	1	0				30
Link to provider's web page	0	0	0	1	1		1	1	1	1	1		1	1		1	1	1		1				65
															X	X			X				X	

Figure 1: Results of the questionnaire on data distribution (black boxes columns indicate institutions operating EIDA nodes)

## **Appendix A Questionnaire on strong motion data distribution**

This questionnaire aims to understand your preferences on data policy before the workshop, in order to prepare a fruitful discussion. Below you find a list of issues and you can select one or more among the possible answers (please, add Y or N after the option).

In Notes your comments, if any, are welcome.

### **1. Data format**

- a. Continuous data streams
- b. Waveforms triggered by the seismic event
- c. Strong motion parameters

Notes:

### **2. Time delay after the earthquake occurrence**

- a. real time
- b. 1 week
- c. 1 month
- d. 6 months

Notes:

### **3. User identification**

- a. no identification, free access
- b. users registration (login and password)

Notes:

### **4. Restrictions**

- a. Research / Academic use
- b. Governmental institutions
- c. Professional
- d. Private companies
- e. No restrictions

Notes:

### **5. Publishing and acknowledgment (web portal)**

- a. Citation
- b. Persistent identifiers
- c. Link to provider's web page

Notes

## Appendix B: Program of the workshop



### International Workshop on Strong Motion and Acceleration Data

Dates: **12.05.2014-13.05.2014**

Venue: Prime Ministry, Disaster and Emergency Management Presidency, Ankara-TURKEY

#### WORKSHOP PROGRAMME

**Day 1: 12.05.2014, -Monday**

##### Opening Session

<b>12.05.2014 – Day - “Registration and Opening Remarks”</b>	
<b>09:00 – 09:30</b>	<b>Registration</b>
<b>09:30 – 10:30</b>	<b>Opening Remarks</b>
	Dr. Lucia LUZI (INGV, ORFEUS WG5)
	Dr. Torild Van Eck (ORFEUS)
	Prof. Dr. Mustafa ERDİK (KOERI)
	Dr. Murat NURLU (AFAD)
	Dr. Fuat OKTAY (TBC) (AFAD, President)

*10:30 – 11:00 Break*

##### 1st Session

<b>12.05.2014 – Day - “Session One: Towards a European integration + Strong Motion Networks in Europe”</b>	
<b>Chair: Assoc. Prof. Dr. Orhan POLAT</b>	
<b>11:00–11:20</b>	European integration of acceleration networks (L. Luzi, INGV)
<b>11:20-11:40</b>	Strong Motion Data Portal under ORFEUS (R. Sleeman, ORFEUS ODC)
<b>11:40-12:00</b>	EPOS: structure and future (M. Cocco, INGV)
<b>Strong Motion Networks in Europe</b>	
<b>12:00:-12:15</b>	Turkish National Earthquake Data Center (T. Kılıç, AFAD)
<b>12:15-12:30</b>	National Strong Motion Network of Turkey (U. Çeken, AFAD)
<b>12:30-12:45</b>	KOERI strong motion network (D. Kalafat and A. Pinar, KOERI)
<b>12:45-13:00</b>	Italian strong motion network (L. Filippi, DPC)

*13:00 – 14:30 Lunch*

##### 2nd Session

<b>12.05.2014 – Day - “Session Two: Best Practises on Strong Motion Data + Strong Motion Networks in Europe”</b>	
<b>Chair: Dr. Murat NURLU</b>	
<b>14:30–15:15</b>	<b>Key-note</b> Use of seismological data for real time analysis (S. Parolai, GFZ Potsdam)

15:15-15:30	Challenges and Recent Developments of the Strong Motion Data Analysis and Processing in Iran (23 Years of Carrier in IIEES, 1991-2014) (M. Zahre, IIEES)
15:30-15:45	Greek strong motion network (speaker to be defined)
15:45-16:00	French strong motion network (P. Gueguen, ISTERRE)
16:00-16:15	Portuguese strong motion network (P. Alves, IPMA)

16:00 - 16:30 Break

### 3rd Session

12.05.2014 – Day - “Open Discussion for the organisation of WG5 and EPOS” Chair: Dr. Lucia LUZI	
16:30-17:30	Panel discussion

19:00 - 21:00 Dinner\*

## Day 2: 13.05.2014

### 4th Session

13.05.2014 – Day - <i>Best Practises on Strong Motion Data Uses</i> Chair: Prof. Dr. Sinan AKKAR	
09:30 – 10:15	<b>Key-note</b> Engineering use of SM data (I. Iervolino, University of Naples)
10:15 – 10:35	AFAD-RED (Rapid Earthquake Damage) (M., Baykal, AFAD)
10:35 - 10:55	Post earthquake rapid loss assessment (K. Sesetyan, KOERI)

10:55 - 11:15 Break

13.05.2014 – Day - “Strong Motion Networks in Europe” Chair: Assoc. Prof. Dr. Ayşegül ASKAN	
11:15-11:30	Swiss strong motion network (C. Cauzzi, ETH)
11:30-11:45	Romania strong motion network (Cristian Neagoe, INFP)
11:45-12:00	Albanian strong motion network (L. Duni, POLYTECHNIC UNIVERSITY OF TIRANA)
12:00-12.15	Iranian strong motion network (E. Farzanegan, BHRC)

### 5th Session

13.05.2014 – Day - “Discussions on the Future Plans and Programmes of Orfeus WG and concluding remarks” Chair: Dr. Torild Van Eck	
12:15 – 13:00	Panel discussion

13:00 - 14:00 Lunch

### 14:30-17:00 Cultural Tour

\* : *Divan Cengelhan Brasserie* (Adres: Necati Bey Mah., Depo Sk Çengelhan Rahmi Mustafa Koç Müzesi No:1, Ulus/İsmetpaşa/Ankara)

## Appendix C: List of participants

NO	COUNTRY	NAME	AFFILIATION
1	Albania	Llambro Duni	Polytechnic University of Tirana
2	Albania	Neki Kuka	Polytechnic University of Tirana
3	Austria	Yan Jia	ZAMG
4	Belgium	Michel Van Camp	Royal Observatory of Belgium
5	France	Philippe Gueguen	RAP
6	Greece	Zaferia Roumelioti	EURO-TestSite
7	Greece	Nikos Theodoulidis	ITSAK
8	Greece	Ioannis Kalogeras	NOA
9	Iran	Esmael Farzenegan	BHRC
10	Iran	Mehdi Zare	Int.Ins.of Earthquake Engineering and Seismology
11	Iran	Zoya Farajpour	Int.Ins.of Earthquake Engineering and Seismology
12	Italy	Luisa Filippi	DPC
13	Italy	Massimo Cocco	EPOS
14	Italy	Lucia Luzi	INGV
15	Italy	Rodolfo Puglia	INGV
16	Italy	İ. Iervolino	University Of Naples
17	Italy	Antonio Emolo	University of Napoli
18	Italy	Giovanni Costa	University Of Trieste
19	KKTC	Ahmet Yılmazbaşar	Civil Defense
20	KKTC	Atilla Samur	Civil Defense
21	KKTC	Orsel Kamalı	Civil Defense
22	Netherland	Reinoud Sleeman	KNMI
23	Netherland	Torild Von Eck	KNMI
24	Portugal	Fernando Carlilho	IPMA
25	Portugal	Paulo Alves	IPMA
26	Romania	Cristian Neagoe	National Ins. for Earth Physics
27	Serbia	G. Kronic	Seismological Survey of Serbia
28	Serbia	Miadrage Petrovic	Seismological Survey of Serbia
29	Switzerland	Carlo cauzzi	SED
30	Turkey	Aytaç Apak	AFAD
31	Turkey	Bengi Eravcı	AFAD
32	Turkey	Derya Kökbudak	AFAD
33	Turkey	Eren Tepeuğur	AFAD
34	Turkey	Erkan Ateş	AFAD
35	Turkey	Fatih Alver	AFAD
36	Turkey	Filiz Tuba Kadirioglu	AFAD
37	Turkey	Güler Yenilmez Aksade	AFAD
38	Turkey	Kerem Kuterdem	AFAD
39	Turkey	Mehmet Baykal	AFAD
40	Turkey	Mehmet Kaplan	AFAD
41	Turkey	Meltem Türkoğlu	AFAD
42	Turkey	Murat Nurlu	AFAD
43	Turkey	Ömer Kılıçarslan	AFAD
44	Turkey	Selim Sezer	AFAD
45	Turkey	Tuğbay Kılıç	AFAD
46	Turkey	Turgay Kuru	AFAD
47	Turkey	Ulubey Çeken	AFAD
48	Turkey	Vedat Özaraç	AFAD

---

49	Turkey	Eşref Yalçınkaya	İÜ
50	Turkey	Can Zülfikar	Kandilli Observatory
51	Turkey	Doğan Kalafat	Kandilli Observatory
52	Turkey	Karin Şeşetyan	Kandilli Observatory
53	Turkey	Nurcan Meral Özel	Kandilli Observatory
54	Turkey	Sinan Akkar	Kandilli Observatory
55	Turkey	Süleyman Tunç	Kandilli Observatory
56	Turkey	Ahmet Yakut	METU
57	Turkey	Ayşegül Aksan	METU
58	Turkey	Orhan Polat	Unv of Dokuz Eylül
59	Turkey	Kemal Beyen	Unv of Kocaeli
60	Turkey	Mustafa Kerem Koçkar	Unv. Of Gazi