

**THE EMILIA THRUST EARTHQUAKE OF 20 MAY 2012 (NORTHERN ITALY):
STRONG MOTION DATASET
- Report III -**

NATIONAL CIVIL PROTECTION DEPARTMENT (DPC): RAN Staff: M. Dolce, M. Nicoletti, A. Ammirati, R. Bianconi, L. Filippi, A. Gorini, S. Marcucci, F. Palma, E. Zambonelli

GEOSIS-LAB UNICHIETI: G. Lavecchia, R. de Nardis, F. Brozzetti, P. Boncio, D. Cirillo, A. Romano

UNIVERSITY OF TRIESTE: G. Costa, A. Gallo, L. Tiberi, G. Zoppé, P. Suhadolc

REGIONE UMBRIA - REGIONAL CIVIL PROTECTION: F. Ponziani, A. Formica

This third report on the Ferrara seismic sequence is aimed at providing the waveforms of all the events with $M_L \geq 4.5$ occurred from May 20 to June 3, 2012.

The DPC strong motion dataset, already distributed as electronic supplementary material within two previous reports (Mirandola Earthquake Working Group - DPC, UniChieti, Uni Trieste, Regione Umbria report 1 and report2 at <http://www.protezionecivile.gov.it/jcms/it/ran.wp>) is here enriched with further recordings. At today we make available a dataset consisting of 339, three components, high quality recordings associated to the 13 events of magnitude $M_L \geq 4.5$, as listed in Tab.1. Also the recordings containing the waveforms retrieved from stations with one faulty channel are given.

The data are provided both in SAC and in ASCII format and they are in nm/sec^2 , the standard unit for the acceleration waveforms in SAC format.

The waveforms are into folder "Earthquakes-Emilia-from_M4.5_to_M5.3" and subfolders labelled by the date and time of events, as indicated in the last column of Table 1, for both formats.

The folders Earthquake-Emilia-05202012-integration and Earthquake-Emilia-05292012-integration contain an update of the dataset already distributed on the $M_L=5.9$ and $M_L=5.8$ events.

Specifically, for pairs of events very close in time, the data are given in a single directory identified by the time of both events. For these pairs of events, the continuous recording containing the two corresponding waveforms is available most of the times.

Summarizing the folders contain:

1) three files for each station referring to each recording channel. For each waveform, the mean value of the signal was calculated and removed, as well as any trend. The users are advised to check the polarity of the signal clearly indicated in the header of these files.

2) The name of the single file corresponds to the time of the first sample of the waveform.

In the ASCII file the time of the first sample is always equal to the "reference time" parameter plus the first value of the first column of the file.

3) the list of the permanent and temporary stations that recorded the events with information on the station code, the coordinates, the toponyms and the model of instrumentation; a "netcode" parameter is added in order to identify to which of the integrated networks, the single station belongs to. The code IT identifies the Italian Accelerometric Network (RAN) stations; the code RF refers to the Friuli Venezia Giulia Region network (RAF) stations.

| Date (dd/mm/yy) | Time (hh:mm:ss) | Lat (°) | Lon (°) | Depth (km) | M _L | Directory |
|--------------------|--------------------|------------|------------|---------------|----------------|------------------------|
| 03/06/2012 | 19:20:43 | 44.899 | 10.943 | 9.2 | 5.1 | 20120603/192043 |
| 29/05/2012 | 11:00:25 | 44.879 | 10.947 | 5.4 | 5.2 | 20120529/110002_110025 |
| 29/05/2012 | 11:00:02 | 44.873 | 10.950 | 11 | 4.9 | 20120529/110002_110025 |
| 29/05/2012 | 10:55:57 | 44.888 | 11.008 | 6.8 | 5.3 | 20120529/105557 |
| 29/05/2012 | 08:27:23 | 44.854 | 11.106 | 10 | 4.7 | 20120529/082551_082723 |
| 29/05/2012 | 08:25:51 | 44.901 | 10.943 | 3.2 | 4.5 | 20120529/082551_082723 |
| 20/05/2012 | 17:37:14 | 44.876 | 11.382 | 3.2 | 4.5 | 20120520/173714 |
| 20/05/2012 | 13:18:02 | 44.831 | 11.490 | 4.7 | 5.1 | 20120520/131802 |
| 20/05/2012 | 03:02:50 | 44.860 | 11.095 | 10 | 4.9 | 20120520/030250 |
| 20/05/2012 | 02:07:31 | 44.863 | 11.370 | 5 | 5.1 | 20120520/020630_020731 |
| 20/05/2012 | 02:06:30 | 44.886 | 11.189 | 7.7 | 4.8 | 20120520/020630_020731 |

TAB. 1. List of seismic events of $M_L \geq 4.5$ occurred up to June 3, 2012 recorded by Italian strong motion network. The source of data for the hypocentral parameters and magnitude is provided by INGV ISIDE database.

ELECTRONIC SUPPLEMENTARY MATERIAL

This report contains supplementary material which is available on line at the DPC ftp site <ftp://ftp.protezionecivile.it> and which will be published in a forthcoming paper. It can be used upon quotation of the present report. The correct citation is :

Mirandola Earthquake Working Group (DPC, UniChieti, Uni Trieste, Regione Umbria) – Report 3 - (<http://www.protezionecivile.gov.it/jcms/it/ran.wp>)

TO DOWNLOAD DATA, PLEASE REQUEST LOGIN AND PASSWORD TO THE FOLLOWING EMAIL ADDRESS:

Mail to: RANUSR@protezionecivile.it

ACKNOWLEDGEMENTS

We thank our colleagues of the Service of the DPC for seismic monitoring of the territory and the colleagues of the Services for IT and for telecommunications of the DPC.

We also thank all the local administrations and the civil protection volunteers that collaborated for siting of permanent and temporary stations.