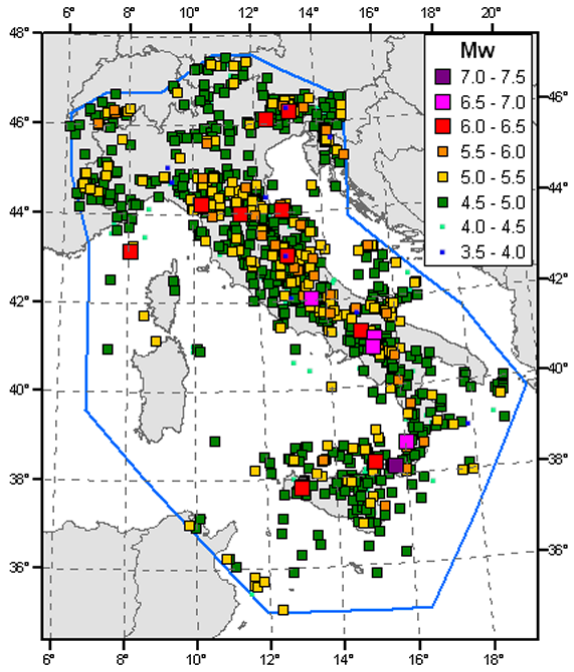
CPTI

CATALOGO PARAMETRICO DEI TERREMOTI ITALIANI

Parametric Catalogue of Italian Earthquakes version 2008 (CPTI08), 1901-2006



compiled by

A. Rovida* and the CPTI Working Group

*Istituto Nazionale di Geofisica e Vulcanologia
Sezione di Milano-Pavia

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Introduction

The compilation of the 2008-2009 version of the CPTI catalogue started in the framework of the INGV-DPC 2004-2006 S1 project on the conclusion and management of the seismic hazard assessment. The compilation was then concluded in the framework of the INGV internal project TTC5.1 “Macroseismic databases and methodologies”.

The 2008 version, limited to the time-window 1901-2006, is a beta version to be tested by the users. It represents an important evolution of the 2004 CPTI04 version (Gruppo di lavoro CPTI, 2004) with respect to both content and structure. In particular:

a) the time-window has been expanded to 2006
b) the supporting macroseismic dataset includes data published up to 2007;
c) the instrumental database has been updated with the use of instrumental bulletins and instrumental parametric catalogues;
d) when macroseismic data are available, the earthquake parameters have been derived in a homogeneous way by means of the Boxer (Gasperini et al., 1999) code, version 3.3, with the exceptions shown at point i);
e) instrumental Mw values have been adopted according to the following hierarchy: i) from moment tensor solutions; ii) from the conversion of Ms, ML, mb values through ad-hoc regressions (Gruppo di Lavoro MPS, 2004). For the cases in which different types of M are available, Mw has been calculated as the weighted mean of the Mw values derived from the regressions;
f) for each Mw value the associated error is provided;
g) when available, both macroseismic and instrumental epicentres and Mw values, with associated errors, are provided;
h) for the cases at point g) a default epicentral location, selected between the two available according to expert judgement, is provided, together with a default Mw value calculated as the weighted mean of the macroseismic and instrumental values, with an associated error;
i) the catalogue also contains entries related to some foreshocks and aftershocks;
j) for some of the earthquakes at point i) macroseismic parameters are not provided, as their intensity data distributions resulted to be partial or actually affected by important accumulations of the effects related to multiple shocks;
k) for a limited number of earthquakes the distribution of the macroseismic data resulted particularly limited (e.g. Italian data of earthquakes with epicentres outside Italy). In order to avoid unreliable determinations of the parameters, in such cases earthquake parameters obtained from other parametric catalogues are provided;
l) for the mainshocks of three sequences (1916, 1929, 1997), the macroseismic parameters are provided with the warning that the related intensity distributions are due to cumulative effects;
m) although the adopted energy thresholds are in principle the same as in CPTI04 (approx. Io = 4-5 and Mw = 4.5), the catalogue contains some hundreds of events below these thresholds;
n) the geographical area covered by the catalogue has been slightly reduced with respect to CPTI04;
o) earthquakes in the Etna volcanic area are not included in the catalogue.

With respect to point b), in addition to the data considered for CPTI04 the supporting dataset of CPTI08 includes data from:

- the release 4 of the Catalogo dei Forti Terremoti Italiani (Guidoboni et al., 2007);
- the French database SISFRANCE (SisFrance);
- the Swiss database ECOS (Swiss Seismological Service, 2002);
- studies on earthquakes in specific areas or single events of particular interest, performed either by INGV or other researchers);
- field surveys of recent earthquakes;
- INGV macroseismic bulletins (INGV, 1982-2006).

As for instrumental data (point c), the following sources have been considered:

- INGV instrumental bulletin (INGV, 1983-2008);
- Mw determined by Pondrelli et al. (2001, 2002, 2004, 2006)
- Italian instrumental earthquake catalogues 1981-1996 (CSTI; CSTI Working Group, 2005) and 1981-2002 (CSI1.1, Castello et al., 2006).

In particular, for the time-window covered by Castello et al. (2006) CPTI08 has adopted the relevant hypocentral, instrumental parameters for 206 events.

Note (2009). According to the tests and to the feedback by the users, the CPTI WG started revising the CPTI08 catalogue. After the April 6, L'Aquila earthquake, the WG decided to release a limited portion of the updated catalogue, limited to Central Italy, to serve as an input for seismic hazard assessment; this version, called CPTI08aq, is currently available for internal INGV use. To avoid confusion, the CPTI08 version was removed from the website; as it was handled to CSEP, it is currently available from the CSEP website, to be used within this project, only.

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CPTI08 format and content

Parameter	Description	Notes	N. of entries
Section 1: origin time			
N	Record identifier	from 2001 to 3592, according to the chronological order of the earthquakes	1591
Year, Mo, Da	Origin time: Year, Month, Day	- from instrumental catalogue - from macroseismic study - from parametric catalogue	853 268 470
Ho	Origin time: Hour	- from instrumental catalogue - from macroseismic study - from parametric catalogue	846 266 462
Mi	Origin time: Minutes	- from instrumental catalogue - from macroseismic study - from parametric catalogue	843 259 448
Se	Origin time: Seconds	- from instrumental catalogue - from macroseismic study - from parametric catalogue	810 110 206
Section 2: macroseimic parameters			
LatM, LonM, TLM	Macroseismic determination of the epicentre and method used	- CI: calculated from intensity data points - CP: from the original parametric catalogue	495 489
Io	Epicentral intensity	- calculated from intensity data points - from the original parametric catalogue	467 483
MwM, DMwM	Macroseismic moment magnitude and associated error	- calculated from intensity data points - calculated from Io (Mw=0.430*Io+2.182)	495 483
Section 3: instrumental parameters			
LatIns, LonIns	Instrumental determination of the epicentre	from the instrumental catalogue	853
De	Depth	from the instrumental catalogue	437
MwIns	Instrumental moment magnitude	- from moment tensor solution - determined with spectral method - converted from another M type - weighted mean of multiple instrumental magnitudes converted to Mw	217 6 683 251
DMwIns	Error associated to MwIns	- 0.09 if from moment tensor solution - 0.15 if from spectral method - resulting from the conversions	217 6 934
Section 4: default parameters			
Latdef, Londef	Default latitude and longitude	- macroseismic Lat, Lon - instrumental Lat, Lon	810 756
Mwdef	Default moment magnitude	MwIns or MwM or weighted mean of the two	1579
DMwdef	Error associated to Mwdef	DMwIns or DMwM or weighted mean of the two	1579
TMwdef	Type of default moment magnitude	- MT = from moment tensor solution - SM = from spectral method - InsC = instrumental, calculated - Mac = macroseismic - Ave = average between MwIns and MwM, weighted on the associated errors	217 6 471 422 463