Geophysical Research Abstracts,
Vol. 11, EGU2009-9850, 2009
EGU General Assembly 2009

Regression analysis of MCS Intensity and peak ground motion data in Italy

L. Faenza and A. Michelini

Instituto Nazionale Geofisica e Vulcanologia, Centro Nazionale Terremoti, Roma, Italy (licia.faenza@ingv.it, michelini@ingv.it)

Intensity scales are historically important because no instrumentation is necessary, and useful measurements of earthquake shaking can be made by an unequipped observer. The use of macroseismics data are essential for the revision of historical seismicity and of great importance for seismic hazard assessment of vulnerable areas.
The procedure ShakeMap (Wald et al., Earthquake Spectra., 15, 1999) provides instrumentally based estimates of intensity maps. In Italy, intensities have been hitherto reported through the use of the MCS (Mercalli, Cancani Sieberg) intensity scale. The DBMI2004 (and the most recent DBMI08) report intensities for earthquakes in Italy that date back to Roman age.

In order to exploit fully the potential of such a long intensity catalogue for past large events and with the aim of presenting ShakeMaps using an intensity scale consistent with that of the past, we have ri-calibrated the relationships between MCS intensity and observed peak ground motion (PGM) values in terms of both peak-ground acceleration and peak-ground velocities. To this end, we have used the two most updataed and complete dataset available for Italy - the strong motion Itaca database and the DBMI08 macroseismic database. In this work we have first assembled a data set consisting of PGM-intensity pairs and we have then determined the most suitable regressions parameters. Many tests have been made to quantify the accuracy and robustness of the results. The new instrumental intensity scale is going to be adopted for mapping the level of shaking resulting from earthquakes in Italy replacing the instrumental Modified Mercalli scale currently in use (Michelini et al., SRL, 79, 2008) and to determine shakemaps for historical events.