



The correlation between Historical and Instrumental Seismicity in the Sansepolcro Basin, Northern Apennines, Italy

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The area investigated, the Sansepolcro basin, is characterized by the presence of important earthquakes in the past with estimated intensity even larger than IX MCS (the 1352 Monterchi earthquake, the 1389 Boccaserriola, the 1458 Citta' di Castello, the 1781 Cagliese and the 1917 Monterchi-Citerna earthquakes, CPTI Working Group, 2004) and by a surprisingly scarce instrumental seismicity compared to the adjacent areas struck by high seismicity (Castello et al., 2005; Ciaccio et al., 2006). The area north of Sansepolcro has been struck in recent years by four minor sequences, occurred between 1987 and 2001 with magnitude ranging from M13.0 to Mw4.7. In this work we analyse the most important earthquakes of the 20th century occurred in the Altotiberina Valley in 1917, 1918, 1919 and 1948; in particular instrumental relocation, focal mechanisms and Ms and Mw magnitude estimation are re-evaluated. The relocation of these earthquakes is particularly critical and is an important issue. An instrumental and precise location is critical for the complexity of the problems associated with the study of seismograms prior to the first half of the twentieth century and is relevant because in the surrounding regions higher seismicity is observed. Regarding this peculiarity of the area, it's very important to detect the location of the historical earthquakes: in particular, the 1917 event is often associated to the possibility that the regional low angle Altotiberina Fault (Barchi et al., 1998) is able or not to nucleate large- or moderate-magnitude events, being historically located close to its surface (Boncio and Lavecchia, 2000).

References:

Barchi, M.R., A. De Feyter, M.B. Magnani, G. Minelli, G. Pialli and B.M. Sotera (1998) Extensional tectonics in the Northern Apennines (Italy): Evidence from the CROP03 deep seismic reflection line, Mem. Soc. Geol. It., 52, 527-538.

Boncio, P. and G. Lavecchia (2000) A structural model for active extension in Central Italy, J. of Geodynamics, 29, 233-244.

Castello, B., G., Selvaggi, C., Chiarabba, and A., Amato (2005) CSI Catalogo della sismicità italiana 1981-2002, versione 1.0. INGV-CNT, Roma <http://www.ingv.it/CSI/>

Ciaccio M.G., Pondrelli S., Frepoli A. (2006) Earthquake fault-plane solutions and patterns of seismicity within the Umbria Region, Italy ANNALS OF GEOPHYSICS, VOL. 49, N. 4/5, August/October 2006.

CPTI Working Group (2004) Catalogo Parametrico dei Terremoti Italiani versione 2004 (CPTI04). INGV, Bologna. <http://emidius.mi.ingv.it/CPTI/>