Epitome

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are embedded in the summit paleo-landscape and are placed at different elevations along the intermontane basin margins, as well as on the slopes of their tributary valleys; geomorphological/stratigraphic evidence clearly indicates that, at different stages, the intermontane basin hosteed closed lakes fed by a centripetal drainage network. Thick sequences of dominantly detrital Saxonean-Quaternary lacustrine/alluvial deposits fill up the intermontane basins, testifying their contemporary active status. The lacustrine/alluvial deposits showed localised changes (e.g. Fucino and Sulmona basins) the spatial distribution of sediments indicates that their deposition is topographically related to the present depressions; other basins (e.g. Sato and Tutano basins) were definitely incomplete; these basins display a consequence of intense tectonic deformation and/or erosion.

The integrated geomorphological/stratigraphic analysis of the Abruzzi Apennines, indicates that the lacustrine/alluvial basins were drained off by progressive erosion, induced in the effluent rivers by the large scale uplift which affected the Apennine during the Quaternary and the contemporary activity of severe normal faults on the Tyrrenhian side (Dramis, 1992; D’Agostino et al., 2001; Galadini et al., 2003). In some cases, competition occurred between the backward fluvial erosion and the activity of normal faults, leading to the basin aggradation.

The extinction of the ancient lakes occurred earlier for the westwestern most "Tyrrhenian" basins (e.g. Sato and Tutano basins) and later for the northeastern "Adriatic" ones (e.g. Aterno and Sulmona basins). This evolutionary trend seems to be quite consistent with the eastward migration of extensional tectonics (Galadini & Messina, 2004) and may undertake a crucial radiating role in the central Apennine evolution. The extant tectonic activity is responsible for the bradyness of the basin.


T40-8 Orale

Gori, Stefano


ACTIVE FAULTING ALONG THE MT. MORRONI SOUTH-WESTERN SLOPE (CENTRAL APENNINES) (Italy)

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Key terms: central Apennines; active faulting; earthquake; slip rate

Active normal faults and fault systems potentially responsible for earthquakes in the study area were identified by field observations. Magnitude up to 7 have been detected in the central Apennines since the beginning of the 20th century. Strong historical earthquakes have been associated to the generation of the paleolandscape and to the dismemberment of the study area. These events have been approximated to the activity of the central Apennines (Italy). Geophysical Journal International, 147, 475-497.

As a result of the occurrence of active faults in the study area, a careful characterization of the tectonic setting is necessary to determine the risk for the people living in the area. The present study was developed following and integrating three different steps: a) characterisation of the structures and their activity; b) identification of the earthquake potential; c) evaluation of the possible local effect from field data and the seismic hazard assessment by the European method. The approach used to reproduce the macroscopic field associated to the Maella earthquakes consists in calculating synthetic strong motion accelerograms. The ground motion is generated using a geotechnical model of the ground motion. The method involves discretization of fault plane into small segments and the contribution of each sub-fault is sumed to reproduce the synthetic acceleration time history. For each point, peak ground acceleration is calculated and compared to the macroseismic intensities using Trifunac and Brady empirical relationships.

The possible seismic sources in the area are represented by the historical seismicity, the instrumental seismicity and the geological data. The analysis of the historical events and the instrumental events are used to define a probabilistic seismic hazard analysis. The analysis of the fault orientation allows to define the possible fault propagation, the geometry and the possible interaction with other faults.

The study area is characterised by a high seismic hazard level and the presence of a dense network of active faults. The presence of a dense network of active faults is a potential risk for the people living in the area. The analysis of the historical events and the instrumental events are used to define a probabilistic seismic hazard analysis. The analysis of the fault orientation allows to define the possible fault propagation, the geometry and the possible interaction with other faults.

T40-9 Orale

Pace, Bruno


THE MAELLA EARTHQUAKES (ABRUZZO, ITALY): SOME INSIGHTS OBTAINED FROM GEOLGICAL AND MACROSEISMIC DATA FOR SEISMIC SOURCE PURPOSE

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Key terms: seismotectonics; historical earthquakes; scenario; Maella; central Italy

The nature and distribution of the seismicity and of the active structures in central Italy show that the active and seismically determined faulting field of central Italy is mainly characterised by two well known lateral zones of seismicity located between the two main seismotectonic provinces with different kinematics. The major earthquakes of the Maella region (Abruzzo, central Italy) like the 1707 (I=IX-X), the 1933 (I=VIII-IX) and the 1881 (I=VII) events are well known. In this intermediate position, outward of the southeastern active NWW-SSW normal fault alignment and inward of the N10°E striking thrust front of the Coastal-Apennine contractional province. These earthquakes have been attributed by some Authors (e.g. Pace et al., 2006) to mid crust thrust faulting along the deep prolongation of the SW-dipping Abradical Fault, but the discussion about a possible upper crust normal faulting is still open.

The analysis of the paleoseismic distribution of the macroseismic data of the Maella earthquakes may greatly help to define the geometry and depth of the seismogenic source and, therefore, to discriminate between the different proposed interpretation of the potential seismogenic source. The reconstrucion of the intensity data field, the evaluation of the possible local effect from field data is necessary. The method involves discretization of fault plane into small segments and the contribution of each sub-fault is sumed to reproduce the synthetic acceleration time history. For each point, peak ground acceleration is calculated and compared to the macroseismic intensities using Trifunac and Brady empirical relationships.

The possible seismic sources in the area are represented by the historical seismicity, the instrumental seismicity and the geological data. The analysis of the historical events and the instrumental events are used to define a probabilistic seismic hazard analysis. The analysis of the fault orientation allows to define the possible fault propagation, the geometry and the possible interaction with other faults.