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## **MORPHOSTRUCTURAL AND SEISMOTECTONIC FEATURES OF EASTERN SICILY**

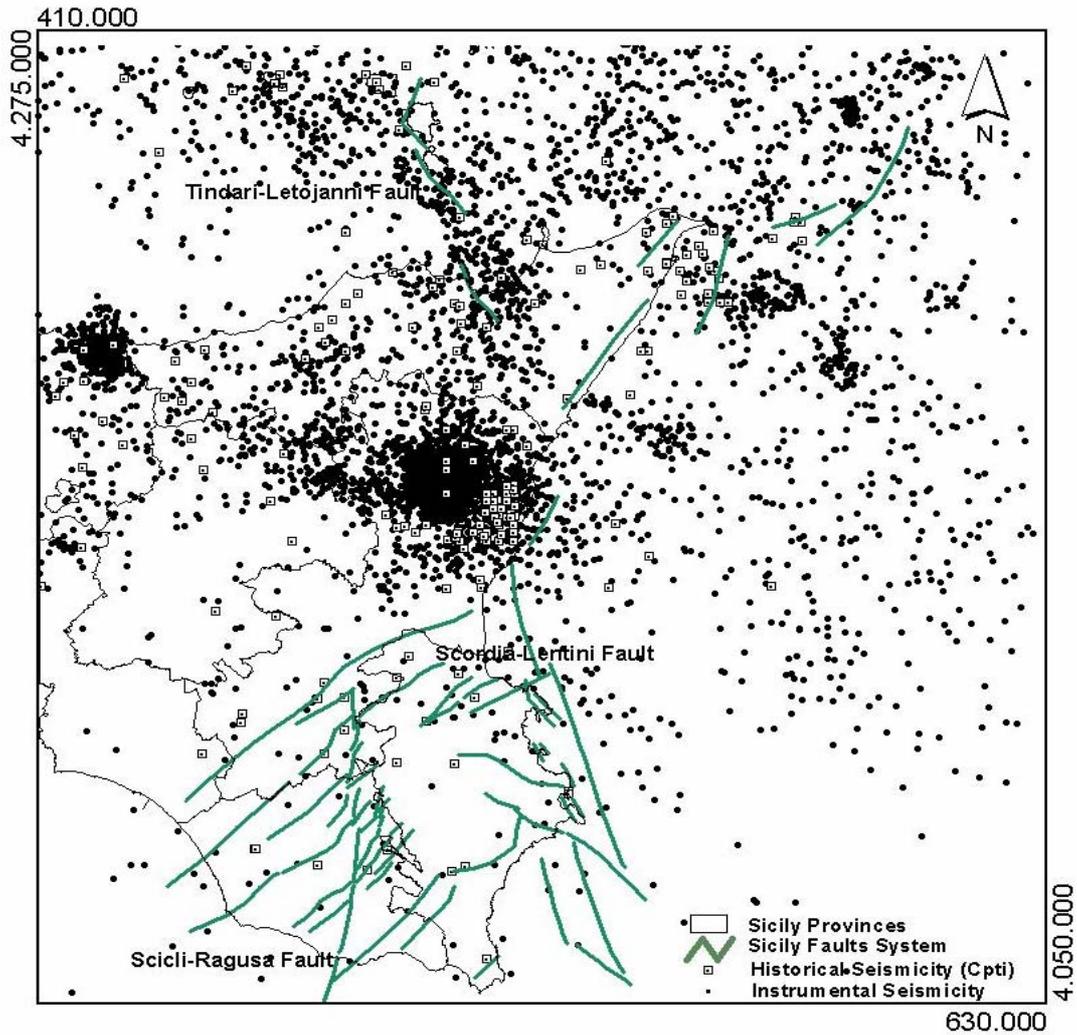
In this study we merge geomorphological, structural and seismic data in order to identify the morphostructural features of the four main domains of the Eastern Sicily (Calabrian Arc, Hyblean foreland, Apennine-Maghrebian units, Mt. Etna). These structural domains, affected by Plio-quadernary faults, which are responsible for large, destructive earthquakes (e.g. 1693 and 1908), are well identified by analysis of DTM-derived data (e.g. the thematic synthetic map obtained by stacking the tangential curvature, profile curvature and slope gradient maps).

Four main large scale morphological discontinuities have been highlighted by the analysis of DTM-extracted geomorphic parameters of terrain: the NE-SW Messina faults, the NNW-SSE Malta escarpment fault, the NE-SW Lentini faults and the N-S Scicli Ragusa faults. Another discontinuity has been recognized between Etna and Cefalu' Basin. This discontinuity, which strikes WNW-ESE, overlies the southern boundary (thrusts) of the Sicilidi units.

Both instrumental and the larger historical earthquakes (Fig. 1) concentrate on Etna, Malta Escarpment, Lentini faults as well as along the central (Tindari-Letojanni fault) and eastern (Sisifo-Filicudi) branches of the Aeolian Islands. Seismicity also occurs along the southern boundary of the Sicilidi units and in the on-land sector of the Cefalu' basin, the most relevant morphostructural feature highlighted by the DTM analyses.

For the Scicli-Ragusa faults, which control the drainage network of Southern Sicily, mainly historical earthquakes are reported (CPTI, 1999).

In situ stress measurements (Ragg et al., 1999) and focal mechanisms (Frepoli and Amato, 2000) suggest the occurrence of a compressive stress in the Hyblean area and in the eastern branch (Sisifo-Filicudi) of the Aeolian Islands. The structural picture of eastern Sicily is dominated by an extensional strain in the easternmost sector and by compressive to strike-slip strain in the central sector. For the seismicity occurring at the southern boundary of the Sicilidi units, available data are not self-consistent. Focal mechanisms suggest an E-W extension, whereas breakout analysis indicate a NE-SW striking compression. In this latter case, the thrusts occurring northwest of Etna must be considered active.



**Fig. 1** - Historical and instrumental seismicity (January 1981-December 2000 from CSTI and Bulletin of the INGV) of the Eastern Sicily region and fault system by bibliography.

## REFERENCES

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