



## **Neotectonic uplift and crustal blocks tilting in Northern Sicily (Central Mediterranean)**

**F. Nigro** (1), R. Favara (1), P. Renda (2), G. Arisco (3), M. Perricone (1), A. Pisciotta (1)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Palermo, via U. La Malfa n. 153, 90146, Palermo, Italy, (2) Dipartimento di Geologia e Geodesia dell'Università, C.so Tukory n. 131, 90134, Palermo, Italy, (3) via Sant'Agata alla Guilla n. 14, 90134, Palermo, Italy

(f.nigro@pa.ingv.it / fax: + 390916809449)

### Abstract

Sicily is located in the Central Mediterranean and constitutes an emerged segment of the Maghrebide chain. Its geologic history is characterized by repeated tectonic events related to extensional and contractional geodynamic processes that have been developing since the Mesozoic.

Northern Sicily is characterized by intense seismic activity, a clear manifestation of active tectonics. In this sector of the island the bulk of the Western Maghrebian Neogene chain, which was subject to a strong uplift during the Plio-Pleistocene, outcrops. The more recent deformations are, for the most part, expressed by systems of extensional and strike-slip faults. However, the uplift rate is not uniform, as suggested by the presence of a range of elevations of recent deposits. These deposits outcrop along the northern coastal sector, and which generally decrease from North-Eastern Sicily towards North-Western Sicily.

These more recent deformations are recognisable both from a structural analysis and from morphometric analysis.

An integrated structural and morphometric investigation to delineate seismo-tectonic zoning is presently in progress, the aim of which is to try to understand the recent/active tectonics of Northern Sicily. This paper describes some of the results regarding the neotectonic structural setting of Northern Sicily, and has been integrated

with morphometric elaborations of landforms deduced from a digital elevation model of the ground (DEM).

The structural characteristics of the main neotectonic faults systems have been analyzed. Their positions and orientations are been compared with those of the main morphostructures and with the distribution of the uplift rates and of the earthquakes. Have been also carried out an analysis of the morphometric pattern to understand the influence of the neotectonic faults activities on the hydrographic network.

The structural and morphometric data suggest that in northern Sicily there is a strictly relation among the neotectonic faults and the landforms. Their comparison with the hydrographic pattern, with the seismicity and with the uplift rates suggest that the Sicilian chain results segmented by deep-seated shear systems that individualize crustal blocks.

In particular, the variation of some of the morphometric parameters within a given area and the drainage network of said area, have made it possible to identify separate homogeneous chain sectors, each of which is subject to different uplift rates and tilting directions.