



A structural and Anisotropy of Magnetic Susceptibility study from the Paleozoic basement, the Mesozoic-Tertiary sedimentary cover and the Pleistocene lavas from the Island of Zannone (Tyrrhenian Sea, Italy).

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The Island of Zannone, the innermost of the western Pontine Islands, is at the footwall of a major fault-controlled escarpment (almost 2500 meters high), which divides the continental passive margin from the oceanic crust of the Tyrrhenian basin. The island represents the only remaining part of the internal Apennine chains that have been extremely stretched and disrupted due to post-Apenninic extension during Pliocene and Pleistocene. This work aims to establish the relationship between the magnetic fabric and the different tectonic phases. Anisotropy of magnetic susceptibility (AMS) has been measured on 142 oriented specimens collected from 19 sites, representing the Paleozoic meta-sandstones, Late Triassic dolomites, Cretaceous to Eocene Scaglia Rossa limestones, Miocenic flysch and the overlying Messinian gyps marls. Further, discordant trachytic lavas have been sampled. The upper part of Dolomia Principale, Maiolica, Messinian marls and Quarternary lavas show mainly isotropic fabrics. In contrary, the metamorphic basement, lower part of Dolomia Principale, Scaglia Rossa and pre-evaporitic Flysch show a well defined magnetic anisotropy.

The structural study of this area showed that this area experienced: (1) pre-Triassic refolding of older isoclinal folds associated with new formation of white mica under low-green schist facies and NNW-directed compression, (2) Early Jurassic (?) rifting related to a NW-striking fault-controlled escarpment, later onlap by Cretaceous to Tertiary deposits and (3) post-evaporitic (Messinian) compression with fold-and-thrust structures, which involves the Mesozoic heritage. The first stage of compression (3a) is directed to the ESE; the second (3b) is directed to the NNW. Finally, (4) Pleistocene syn- to post-volcanic extension, parallel to the main regional stretching direction of the Tyrrhenian basin (NE-SW) and perpendicular to it (NW-SE) has been observed. The AMS showed apart from sedimentary fabrics, that sites in Tertiary limestone display composite to tectonic fabrics related to compressive tectonic overprint. According to their structural position and lithology AMS records different tectonic steps mostly associated to post-evaporitic compression in step (3).