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ELENCO DEI CONTRIBUTI

metamorphic evolution of the Punta Nera Unit allow us to compare the evolution of this area with the geothermal areas of Southern Tuscany and to define their structural setting.

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EVIDENCE OF A MAJOR BREACH OF THE ROOF UNITS OF THE SOUTHERN APENNINE DUPLEX SYSTEM IN THE PICENTINI MOUNTAINS.

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In the Picentini Mountains (Southern Apennines), Mesozoic shallow-water carbonates belonging to the Campania-Lucania platform overlie with a low-angle thrust surface Mesozoic-Tertiary deep-water deposits belonging to the Lagonegro domain (Ietto 1963a, b; 1965; Scandone *et al*. 1967). The tectonic contact is exposed in several tectonic windows. In the Campagna window, the most important structural feature in the region, the Lagonegro units, in turn, tectonically overlie Lower-Middle Miocene siliciclastic flysch deposits (Vallimala sandstones and limestones in Scandone and Sgrosso 1974) stratigraphically covering Triassic to Paleogene carbonates. These carbonates and the overlying siliciclastic deposits are known in the geological literature as Monte Croce Unit (Scandone *et al*. 1967).

Lagonegro deposits sandwiched between two carbonate units, known only in the Campagna tectonic window, have been matter of debate in the geological literature. Three different interpretations have been proposed:

- Primary tectonic superposition of the Lagonegro nappes on the Campania-Lucania platform and subsequent breach of the tectonic couple (Scandone 1967);
- Enucleation of second order imbricates during the tectonic transport of the Campania-Lucania carbonate thrust sheets on the Lagonegro basinal deposits;
- Tectonic superposition of the Campania-Lucania *plus* Lagonegro units on the sothwestern margin of a more external platform domain correlated with the Abruzzi-Campania carbonate platform (Scandone and Sgrosso, 1974).

Recently, the Monte Croce unit has been penetrated by the Acerno 1 well, a borehole located in correspondence to the northwestern margin of the Campagna tectonic window that has reached a depth of 4625 metres. In the first 1235 metres, the well encountered the tectonics units identified on the surface, confirming the observed geometry:

- 0-295 m Triassic dolomites of the Campania-Lucania platform;
- 295-472 m Triassic cherty limestones of the Lagonegro Unit II;
- 472-940 m Miocene siliciclastic deposits referable to the Vallimala sandstones and limestones of the geological literature;
- 940-1235 m Triassic dolomites of the Monte Croce Unit.

From 1235 m to 4286 m, the borehole drilled four Lagonegro thrust sheets separated by tectonic contacts at 1992 m, 3409 m and 3975 m. At 4286 m, finally, the well encountered the top of the Apulia platform.

The information provided by Acerno 1, together with the evidence derived from the surface geology, allowed as to interpret the superposition of the Lagonegro units on the Monte Croce Unit as a major breach cutting across the primary tectonic couple made up of the Campania-Lucania and Lagonegro thrust sheets. The contact at 295 m (representing the projection in the subsurface of the contact between the Campania-Lucania carbonates and the Lagonegro deposits exposed in all tectonic windows in the Picentini Mountains) and the contact at 1235 m are the same thrust surface cut through and displaced by the breach encountered at 472 m. The latter corresponds to the contact between the Lagonegro and Monte Croce units exposed only in the Campagna tectonic window.

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TECTONIC EVOLUTION OF THE LACHLAN FOLD BELT (SOUTHEASTERN AUSTRALIA): INSIGHT BY A NUMERICAL MODEL

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It is clear that the the geodynamical history of an orogen could be only completely described using all the geological and geophysical data acquired over the years. Thus, it will be useful to integrate field geology (structural, geological, stratigraphic analysis), that gives information about the shallow structure, with geophysical investigation (gravimetry, seismic soundings), that offers a tool to understand the deeper geometry of a structure. Along with the geological and geophysical investigations, quantitative analysis of the geological structures has been developed in the last years. In particular, with recent advances in computing power, numerical simulations have considerably improved the understanding of the geomechanical and geodynamical behavior of a particular region. Among the numerical techniques used in geology, the Finite Element Method (FEM) is the most widely used to solve the static and dynamical problems of a geological structure with complex geometry and linear and/or non-linear rheology. In recent years, numerical simulations have represented a novel way of testing geodynamical models. FEM modeling has been used to constrain the geodynamical evolution of an orogen or to emphasize factors controlling the belt evolution. In this work a fully coupled, thermo-mechanical, 2D, finite-element model has been applied In order to study the geodynamical evolution of the Lachlan Fold Belt (Victoria, Australia).

We have used a coupled thermo-mechanical finite element model of crustal deformation driven by mantle/oceanic subduction to demonstrate that the tectonic evolution of the Lachlan Fold Belt during the mid-Palaeozoic (late Ordovician to Early Carboniferous) can be linked to continuous subduction along a single subduction zone.