



3D Structural Geological Model of the Alpi Mt. Area (Southern Italy)

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The study area is located in the inner portion of the southern Apennines fold-and-thrust belt. The Alpi Mt. is the only portion of the Apulian domain cropping in this sector. In fact, it is considered as a structural analogue of the Val d'Agri and Tempa Rossa reservoirs (Basilicata). The Alpi Mt. tectonic unit is composed of two main chronostratigraphic intervals, represented by a 2000m-thick Mesozoic carbonate succession and a Messinian mixed carbonate-terrigenous succession. The Messinian interval is made up of a Lower Messinian sedimentary cycle, which forms a paraconformity with the underlying Mesozoic carbonates, and an Upper Messinian cycle characterized by a marked unconformity at the bottom. This study aims to better understand the role exerted by the precontractual tectonic structures during the Messinian interval, which are responsible for the development of the sedimentary angular unconformity. To reach this goal, a 3D structural geological model was built up by using the Gocad(R) software. The construction of the 3D model was gained through the integration of several results related to geological field mapping, well log analysis and seismic reflection data. Focusing on the Upper Messinian sedimentary horizon, in order to achieve the true geometry and kinematics of the high-angle extensional faults that bound the sedimentary depocenters, the model was restored through vertical line methodology. This process allows to obtain more information about location, geometry, and sedimentary depocenter orientations. Furthermore, the 3D structural model brings some important results from the 3D fault analysis that are represented by attitude, geometry and dimensional parameters of the fault network that affect the study area.