



Link between upper and lower plate deformation in the Tyrrhenian domain.

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The tectono-stratigraphic evolution of the peri-Tyrrhenian basins is the key for understanding the geodynamics of the central Mediterranean. Numerous seismic tomography studies have been carried out in this region, proposing different reconstructions of the lower subducting plate and causes of the slab-break-off existing beneath the Southern Apennines. However, the mode of the recent deformation of the Tyrrhenian Sea is still not fully understood. In this study, we combine the analysis of a recent seismic tomography model and geological data, in order to understand the relationship between the subducting lower plate and tectonic evolution of the sedimentary basins formed on the upper plate.

With this aim, we interpret a large data set of seismic reflection profiles and several well logs and integrate them in a dedicated Geographical Information System (GIS) environment. Our results consist in 2D and 3D geological models of the basins infill and fault network. Taking into account the geological evolution of the peri-Tyrrhenian margin, we observe: (i) a system of linked sedimentary basins developed on a narrow deformation belt bounded by transform fault zones; (ii) a polyphased rifting within the upper plate; (iii) an abrupt change of the direction of extension ($\sim 90^\circ$), from NE-oriented in the Lower Pleistocene to SE-oriented in the Middle Pleistocene. Since these peri-Tyrrhenian basins features are not the typical expressions of the current backarc extensional models, we propose a new model of the evolution of the upper and lower plate.