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Rheological behaviour of the crust from Neapolitan Volcanic Zone to Apulia foreland, Southern Apennine (Italy)

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Rheology is a crucial factor to understand the mechanical behaviour and evolution of the crust of young and tectonically active belts. For this reason, we have investigated the crustal rheology of the Southern Apennine chain along a WSW-ENE oriented cross-section, running from Neapolitan Volcanic Zone to Apulia foreland. A computed thermal modelling and re-localized hypocentral distribution of earthquakes of the area, have been used to constrain the rheological model. Results show that beneath the Neapolitan Volcanic Zone the brittle/ductile transition is located at about 8 km of depth, whereas in correspondence with the axial zone of the chain the rheology shows two brittle horizons, whose top are located at 20 km and 30 km depth, respectively. The computed brittle/ductile transition well agrees with the hypocentral distribution along the study section. We infer that the rheological model could be taken into account, as a first order approximation, to better understand the mechanical behaviour of the Southern Apennine crust.