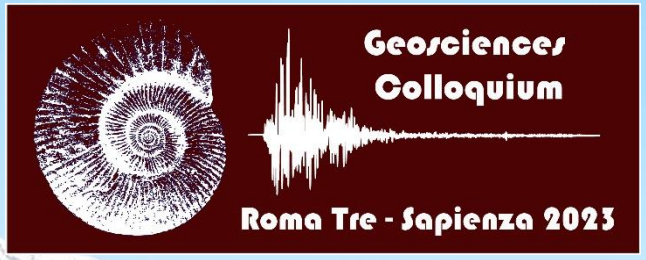
Geosciences Colloquium 2023



18.04.2023 h:16:00

Largo S. Leonardo Murialdo 1,Rome, room E (and on Teams)

3D Architecture of the active northern Hellenides fold and thrust belt in Albania

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ABSTRACT

In this seminar, a 3D structural model of the northern part of the outer Hellenides fold and thrust belt will be presented. The study area, located in Albania and adjacent offshore, is characterized by intense thrust-related seismicity. Active basement thrusting is pointed out by the Mw 6.4, November 2019 Durres earthquake. Our structural model, including basement-involved thrust ramps in the frontal part of the belt, may be used to obtain relevant information on previously overlooked seismogenic sources in the coastal area of Albania.

The seismotectonic setting of this area is the result of a change in thrust tectonics style – from thin-skinned to thick-skinned – that occurred during the Pliocene (~ 5 Ma). Thick-skinned thrusting was accompanied by the transcurrent reactivation of a major basement fault zone, i.e. the Elbasan-Vlora Transfer Zone, which represents a marked feature in our structural model. The estimated dextral offset (~ 28 km) accommodated by this transfer zone is consistent with the differential advancement of the basement-involved thrust front in the northern and southern sectors of our structural model.

Pliocene-Quaternary acceleration of tectonic rotations (recorded by available paleomagnetic declinations) testifies unprecedented evidence of faster oroclinal bending during thick-skinned thrusting – and associated basement-involved strike-slip faulting – with respect to previous stages of detachment-dominated thrusting of the sedimentary cover. This feature suggests that synorogenic thermal weakening of the crust and associated strain softening may trigger efficient – locally seismogenic – basement-involved deformation in the outer zones of fold and thrust belts.