



## **3D numerical simulations of subduction and mantle flow beneath SE-Carpathians**

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The seismicity in the SE-Carpathians, in particular associated with the Vrancea region, is characterized by an abundance of intermediate-depth earthquakes located within a narrow region which is commonly associated with an ongoing oceanic slab breakoff process. In this study we present preliminary results of 3D numerical simulations of subduction and mantle flow beneath SE-Carpathians. Our simulations are tailored to the geodynamic evolution of the Carpatho-Pannonian region during Miocene, and include the opposite rotation of two crustal blocks (North Pannonian and Tisa-Dacia blocks), and the cessation of subduction from north to south in the last 10 Ma. The numerical simulations show the successively propagation of a slab tear towards the southeast, consistent with the propagation and cessation of volcanism in the region. Additionally our simulation revealed the presence of a slab parallel mantle flow field resulting from a combination of slab roll-back and flow around the slab edges. This result is also consistent with the observed deformation fabrics in mantle xenoliths from the central part of the Carpathian–Pannonian Region and with seismic shear wave splitting data.