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Adria microplate fragmentation: geophysical perspective

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Adriatic microplate (Adria) has been a major component of the central Mediterranean geodynamic history since at least Late Cretaceous time. Although Cenozoic motion of Adria is relatively well established, there remains several open questions regarding its dynamics. This is especially evident when trying to reconstruct the motion of Adria since early Miocene. Although there is a general consensus about the counterclockwise rotation of Adria with respect to Europe, the amount of this rotation is still a matter of vigorous debate. In order to explain various measurements, several models of Adria motion were introduced: 1) Adria moving in conjunction with Africa, 2) Adria moving independently as a single block and 3) Adria moving independently but divided into two fragments.

Here we explore the third model by using data from temporary seismic station deployments (AlpArray and AlpArray-CASE) and available permanent stations surrounding the Adriatic Sea. We constructed the tomography image of the Adriatic Sea region using the interstation surface wave dispersion measurements from teleseismic events. Additionally, we test the properties of the Central Adriatic crust by analyzing P-receiver functions from mid-Adriatic island seismic stations. Preliminary results show anomalous lithospheric structure in the Central Adriatic dividing Adria into two sections thus indicating that Adria fragmentation has progressed all the way to the base of the lithosphere.