Mapping the long route of the Tyrrhenian slab through the mantle

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In the south-eastern corner of the Tyrrhenian basin, in the central Mediterranean Sea, a tight alignment of earthquakes along a well defined Benioff zone marks one of the narrowest active trenches worldwide, where one of the last fragment of the former Tethys ocean is consumed. Seismic tomography furnishes snapshot images of the present-day position of this slab, and seismic anisotropy allows to reconstruct the past kinematics of the subduction process. Using seismic anisotropy fast directions as a proxy for the present and past mantle flow, we look backward for the seismic traces of the slab motion through the Western-Central Mediterranean mantle, from the starting locus of subduction toward its current day position. The result of combining independent data sets provides a coherent pattern of anisotropy that illustrates an example of slab rollback from its initiation point to its present-day location.