

## **Comparing the Gibraltar and Calabrian subduction zones (central western Mediterranean) based on seismic tomography**

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The Central Western Mediterranean (CWM) was shaped by a complex tectonic and geodynamic evolution. Deep seismicity and tomographic studies point to the existence, under the Alboran and Tyrrhenian Seas, of lithospheric slabs extending down to the bottom of the mantle transition zone, at 660 km depth. Two narrow arcs correspond to the two slabs, the Gibraltar and Calabrian Arcs (e.g., Monna et al., 2013; Montuori et al., 2007). Similarities in the tectonic and mantle structure of the two areas have been explained by a common subduction and roll-back mechanism for the opening of the CWM, in which the two arcs are symmetrical end products. In spite of this unifying model, a wide amount of literature from different disciplines shows that many aspects of the two areas are still controversial. We present a new 3-D tomographic model at mantle scale for the Calabrian Arc and compare it with a recently published 3-D tomographic model for the Gibraltar Arc by Monna et al (2013). The two models are based on non-linear inversion of teleseismic phase arrivals, and have scale and parametrization that allow for a direct comparison. Unlike previous studies the tomographic models here presented include Ocean Bottom Seismometer broadband data, which improved the resolution of the mantle structures in the marine areas surrounding the arcs. We focus on key features of the two models that constrain reconstructions of the geodynamic evolution of the CWM (e.g., Monna et al., 2015). At Tortonian time the opening of the Tyrrhenian basin was in its initial stage, and the Calabrian arc formed subsequently; on the contrary, the Gibraltar arc was almost completely defined. We hypothesize that the complexity of the continental margin approaching the subduction zone played a key role during the final stages of the arc formation.

### References

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