



## **The key role of continental collision in the episodic backarc extension behaviour in the Central Mediterranean**

Valentina Magni (1), Claudio Faccenna (2), Jeroen van Hunen (1), and Francesca Funiciello (2)

(1) Durham University, Earth Sciences, Durham, United Kingdom (valentina.magni@durham.ac.uk), (2) Università Roma Tre, Dipartimento di Scienze, L.go San Leonardo Murialdo 1, Rome, Italy

The opening of the Tyrrhenian basin in the Central Mediterranean is a well-documented example of backarc extension, which is characterized by short-lived episodes of spreading. We present results from three-dimensional numerical models of subduction that explain the mechanism of backarc basin opening and its episodic spreading behaviour. We show that the entrance of continental plates (Africa and Adria) nearby oceanic subduction (Ionian slab) is important to trigger the formation of a backarc basin. Indeed, this lateral variation along-trench produces localised deformation within the overriding plate and allows the opening of the backarc basin. During this process the trench retreating velocity dramatically increase for few million of years. Afterwards, the slab breaks off forming slab windows at the ocean/continent boundaries and causing a second peak in the trench retreating velocity. This is in very good agreement with what is observed in the Central Mediterranean, where two slab window formed: one in northern Africa around 12-10 Ma, and propagates laterally westward beneath Sicily until the Middle Pleistocene, and a second one beneath the Central Apennines in the Middle Pleistocene. Our model indicates that the opening of those slab windows is a necessary condition for the second phase of rollback in the Tyrrhenian.