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## **Paleomagnetic rotations and microplate-terrane dispersal during back-arc basin opening: from Greater Iberia rotation and fragmentation to Calabria and Peloritan terrane drift**

**Gaia Siravo** and Fabio Speranza

Istituto Nazionale di Geofisica e Vulcanologia, Roma II, Roma, Italy (gaia.siravo@ingv.it)

The Oligocene-to-present tectonic history of the western Mediterranean region is characterized by the ESE-ward roll-back of Alpine and Neo Tethys oceanic slab fragments that determined the diachronous spreading of two back-arc basins: the Liguro-Provençal Basin between 30 and 15 Ma and the Tyrrhenian Sea between 10 and 2 Ma. Such geodynamic events induced the fragmentation and dispersal of the Alpine chain through the formation and migration of microplates and terranes, making the debate on the nature, origin, and evolution of such crustal blocks vivid since the 1970s. For instance, it is commonly accepted that the Corsica-Sardinia microplate rotated counterclockwise (CCW) by at least 50° during Oligo-Miocene and that the Calabro-Peloritan, Kabylies and Alboran blocks drifted hundreds of kms on top of nappe piles ESE-ward, SE-ward and SW-ward, respectively. These blocks, know all together as AlKaPeCa, presently form isolated and enigmatic igneous/metamorphic terranes stacked over the Meso-Cenozoic sedimentary successions of the Apennines and Maghrebides. Besides back-arc basins widths and ages, no other kinds of geologic/geophysical data from Corsica-Sardinia microplate or AlKaPeCa terranes constraining their drift magnitudes exist. On the other hand, drift timing may be properly documented by paleomagnetic vertical-axis rotations obtained from different age rocks, and such data usefully complement ages derived from back-arc basins.

Here we show the synthesis of paleomagnetic investigations carried out during the last few years on the Calabro-Peloritan terrane, and Sardinia, where a different pre-21 Ma rotation history is proposed. We paleomagnetically sampled the Meso-Cenozoic sedimentary cover of the Calabrian (Longobucco succession) and Peloritan (Longi-Taormina succession) terranes and the mid-late Eocene continental Cixerri Formation of SW Sardinia. In addition, we re-evaluated previous paleomagnetic results from the whole Corsica-Sardinia microplate and considered the robust Serravallian-Pleistocene dataset from the Calabrian block. Such data indicate a novel rotation and drift history in the western Mediterranean region (Siravo et al., 2022; 2023). The South Sardinia, Peloritan and Calabrian blocks belonged to the "Greater Iberia plate" before mid-Oligocene (<30 Ma) dispersal, as they all show its characteristic paleomagnetic fingerprint (middle Cretaceous 30°-40° CCW rotation). Rifting of the Liguro-Provençal between 30 and 21 Ma induced 30° CCW rotation of both South Sardinia and Calabria blocks, whereas the Peloritan block, located further south, was passively drifted SE ward at the non-rotation apex of a Paleo Appennine-Maghrebides orogenic salient. South Sardinia plus the adjacent Calabrian block and North Sardinia-Corsica blocks assembled in the early Miocene and rotated 60° CCW as a whole between 21 and 15 Ma. After 10 Ma the Calabrian block detached from south Sardinia following the opening of the Tyrrhenian Sea and rotated 20° clockwise (CW), at the apex of a Neo Appennine-Maghrebides Arc. On the other hand, the Peloritan terrane rotated 130° CW on top of the Sicilian Maghrebides, along the southern limb of the orogenic salient.

## REFERENCES

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