
Post-Eocene rotations in the Western Alpine realm: a review from sixty six years of paleomagnetic investigations

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Résumé

A synthesis of more than 55 paleomagnetic studies yielding Tertiary primary or secondary magnetizations is used to evidence the rotations around a vertical axis since 40 Ma in the Western Alps and surrounding areas. Several areas with similar pattern of rotation are outlined. They do not correspond exactly to the classical paleogeographic zones. In both external and internal zones of the orogenic prism, the rotations seem to be latitude dependent. In particular a widespread Eocene remagnetization of the Mesozoic European cover from Jura to Provence suggests possible effects of oroclinal bending on the European crust as well as small local rotations of the External units of the belt. The most prominent feature is a consistent large (20-60 degrees) counterclockwise rotation observed in internal units and in the Northern Apennine areas. Also, the Corsica-Sardinia block rotates similarly. Since the late Oligocene, apparent rotations around vertical axis are small ($\sim 25^\circ \pm 15^\circ$) North of the Po plain while they reach $\sim 48^\circ \pm 11^\circ$ South of it. It implies that the Torino-Monferrato North verging thrust plays a major role in accommodating the differential rotation. Therefore, domains separated from Europe by oceanic sutures (*i.e.* Liguria + Corsica-Sardinia) can play as rigid bodies, while on the contrary, internal deformation deduced from paleomagnetic studies evidence that Apulia cannot be anymore regarded as a rigid body. In the Western Alps, the plate boundary, first localised at the ophiolite suture is then shifted along the Penninic Frontal Thrust. In the light of this synthesis, the discussion on the origin of the Briançonnais domain can be tackled. Tectonic models of the Alps that do not take into account the observed rotations have clearly to be reappraised.

Mots-Clés: paleomagnetism, rotations, Western Alps, Apennine, Corsica, Briançonnais, Penninic Frontal Thrust

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