



## **Palaeomagnetism of Permian and Triassic sequences from the Toulon-Cuers Basin, France**

B. Huber (1), J. Weber (1), **V. Bachtadse** (1), G. Muttoni (2), A. Ronchi (3) and M. Durand (4)

(1) Ludwigs-Maximilians-Universität, Dept. für Geo- und Umweltwissenschaften, Theresienstrasse 41, D-80333 München, (2) Università degli Studi, Dipartimento di Scienze della Terra, Via Mangiagli 34, I-20133 Milano, (3) Università di Pavia, Dipartimento di Scienze della Terra, Via Ferrata 1, I-27100 Pavia, (4) Université Henri Poincaré, Nancy I, Sciences de la Terre et UMR G2R, F-54506 Vandoeuvre cedex

Recent palaeomagnetic studies on Permian sediments and volcanic rocks of Sardinia revealed a rather complex pattern of rotational movements between Northern, Central and Southern Sardinia, which are mostly counterclockwise with respect to the Apparent Polar Wander Path for Stable Europe. This suggests that crustal coherence of Sardinia during the late Paleozoic cannot be maintained any longer. On the other hand, the counterclockwise rotations observed on the island are counter-intuitive to the deformation pattern expected within a right-lateral shear zone between Gondwana and Laurasia mainly during the Permian as proposed by Arthaud and Matte (1977). In order to address this problem, a detailed study of Permian and Triassic continental sequences exposed in Southern Provence, France has been undertaken. In fact, a strict lithostratigraphic correlation has shown that this region was closely facing the Nurra Basin of Northwestern Sardinia prior to the opening of the Alboran Basin in the Cenozoic. Sedimentary and Volcanic rocks have been sampled at 18 sites in the Toulon-Cuers Basin, and about 150 specimens have been subjected to detailed thermal demagnetization experiments. The directional behavior of the material during demagnetization is rather simple and after removal of viscous overprints at low temperatures almost all specimens show well-defined linear trajectories trending to the origin of the orthogonal projections. The resulting overall mean direction for the Permian rocks is Dec. =  $177^\circ$  Inc. =  $-20^\circ$  ( $\alpha_{95} = 7^\circ$ ,  $k = 61$ ,  $N = 9$  sites) indicating some 30 degrees of counterclockwise rotation with respect to the nearby Esterel Massif (Zijderveld, 1975). We note, however, that two sites near Les Salettes, yield well defined

site mean directions pointing toward the south-southwest (after bedding tilt correction) with shallow negative inclinations and indicating clockwise rotation with respect to Esterel. A positive conglomerate test suggests the primary character of these directions. Three sites of Triassic sediments yield a mean direction of Dec. =  $190^\circ$ , Inc. =  $-23^\circ$  ( $\alpha_{95} = 12^\circ$ ,  $k = 96$ ), which is rather close to the Triassic part of the European APW path and suggests that rotation of the Toulon-Cuers Basin is pre-Triassic in age. A positive reversal test strengthens our interpretation that this is a primary direction. The results of this study, in combination with data presented earlier for Sardinia, shed new light on the tectonic evolution of this region during the Permo-Triassic, which was far more complicated than previously assumed.