



The Internal Metamorphic Zone of Pyrenees: an allochthonous unit ?

Maxime Ducoux (1,2,3), Charles Gumiaux (1,2,3), Thierry Baudin (2), Laurent Jolivet (1,2,3), Florence Cagnard (2), and Abdeltif Lahfid (2)

(1) Univ. d'Orléans, ISTO, UMR 7327, 45071 Orléans, France, (2) BRGM, ISTO, UMR 7327, BP 36009, 45060 Orléans, France, (3) CNRS/INSU, UMR 7327, 45071 Orléans, France

The localization and strike of compressional structures developed in the Pyrenees during the Iberian-Eurasian collision are strongly controlled by structures inherited from earlier tectonic events. This structural inheritance results in the first place from the Variscan orogeny, then from the Cretaceous rifting episode. The consequences of this extension are particularly well developed in the North Pyrenean Zone (NPZ), a relatively narrow domain that focussed strong localization during subsequent shortening. The position of the Internal Metamorphic Zone (IMZ) that makes the southern part of the NPZ is debated. The IMZ displays very specific structure and lithologies (foliated marbles, sometimes brecciated, peridotites...) within a narrow stripe with a width limited to a few kilometers, from the Agly massif in the east, all the way to the Spanish Basque massifs where it forms the "Nappe des Marbres". These marbles result from the metamorphic transformation of the carbonate series of extensional basins presumably of Jurassic to lower Cretaceous age. The HT-LP metamorphism reached temperatures of 550-600°C in the IMZ and the Nappe des Marbres and surrounding formations, represented by the Paleozoic basement or Mesozoic series are not exempt of metamorphism, with measured maximum temperatures up to 350°C. The temperature contrasts measured within the NPZ and the deformation intensity contrasts imply late post-metamorphic movements bringing the high-temperature and low-temperature domains into close contacts. This observation and the geometrical relations observed in the field suggest the allochthony of the IMZ. We present a new interpretation of the 3D geometry of the NPZ following this hypothesis and discuss the implications for the overall geometry of the Pyrenees.