



Lithospheric-scale magnetotelluric characterization of the West-Central Pyrenees: preliminary results

Joan Campanyà (1), Juanjo Ledo (1), Pilar Queralt (1), Alex Marcuello (1), Montserrat Liesa (2), and Josep Anton Muñoz (1)

(1) Institut Geomodels, Departament de Geodinàmica i Geofísica, Universitat de Barcelona, C/Martí Franques s/n. Barcelona 08028, Spain., (2) Departament de Geoquímica, Petrologia i Prospecció Geològica, Universitat de Barcelona, C/Martí Franques s/n. Barcelona 08028, Spain.

The Pyrenees resulted from the continent-continent collision between Iberian and European plates during the Alpine orogeny. Although the dominant East-West strike direction, the Pyrenees present different characteristics along the strike. Lateral variations of the subduction of the Iberian plate below the European one are suggested by independent geological and geophysical studies. With the aim to characterize the lithospheric-scale geoelectrical variations along the Pyrenees, after constraining the geoelectrical lithosphere below the Central Pyrenees, we present the preliminary results of the magnetotelluric study realized in the West-Central Pyrenees.

Magnetotelluric (MT) data were acquired in summer of 2010 and consist of 21 magnetotelluric sites with BroadBand Magnetotelluric (BBMT) data crossing the West-Central Pyrenees from the Ebro Basin to the Aquitan Basin, 7 of them including Long period Magnetotelluric (LMT) data. BBMT data were acquired using a Metronix ADU06 and ADU07 systems which recorded the horizontal components of the electromagnetic field. LMT data were acquired using a LEMI system designed by the Lviv Center of Institute of Space Research which recorded the five components of the electromagnetic field. The combination of the BBMT and LMT data allows us to cover a period range between 0.001 s and 20 000 s. The average distance between sites is 15 km for the sites with LMT data and 6 km for the sites with BBMT data. The use of BBMT and LMT data and the spaced between sites ensures sufficient coverage to image the geoelectrical lithosphere below the West-Central Pyrenees from the upper crustal structures to the bottom of the lithosphere.

Dimensionality analysis and strike determinations have been carried out using the decomposition of magnetotelluric impedance tensor and the rotational invariants. Apparent resistivity, phases and induction vectors are used to constrain the geoelectrical structures located below the West-Central Pyrenees.