



PICASSO Phase I: MT Investigation of Spain from Madrid to the Betics - preliminary results and models

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The first phase of the DIAS magnetotelluric (MT) component of the PICASSO (Project to Investigate Convective Alboran Sea System Overturn) project was carried out in Southern Spain from Sept.-Nov., 2007. PICASSO is an international, multi-disciplinary project that aims to improve knowledge of the internal structure and plate-tectonic processes in the highly complex three-dimensional region formed by the collision of the African and European plate under the effect of the Mediterranean plate motion.

Two different types of magnetotelluric (MT) equipment - broadband (BBMT) and long period (LMT) MT - were used along a profile from the outskirts of Madrid to the Mediterranean Sea through the Betic Mountain Chain. In spite of low solar activity during acquisition, the time series data are of good quality at most sites due to the excellent instrumentation and careful site location. The modified acquisition design of one of the equipment types (the LEMI long period system) with separate recording of each telluric channel allowed for advanced investigation of the dataset. The data were processed using four different robust algorithms, and the different responses have been compared. Pseudosections of responses from this first phase show a remarkably complex subsurface structure dominated by a slightly southwards dipping, conductive slab underneath the region of the External Betic Chain. Strike direction varies along the profile and with depth due to the intricate morphology, and its choice has an enormous impact on the responses to be modelled and thereby provides a challenging framework for MT data interpretation.

This paper will describe the experiment and show representative responses and strike analyses. Preliminary models derived from different assumptions about strike coordinates will be compared and contrasted, and common features interpreted.