



GarField - A MT Survey of the Crustal Structure of the Intraplate Volcanic Region La Garrotxa, Northwestern Spain

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The Olot Volcanic Zone (OVZ) is located between the southern boundary of the Pyrenees, the eastern side of the Ebro Basin and the northern end of the Catalan Transverse System. The structural pattern of the zone is dominated by the E-W thrusts and folds intersecting NW-SE faults, which are related to the Alpine compressive deformation. A system of NE-SW extensional faults resulted from the Neogene distensive episode, which affected the whole eastern flank of the Iberian Peninsula (Gallart et al. 1990). The volcanism ranges in age between 10,000 and 110,000 years, and up to 9 different lava flows have been described. This complex fault system in such a highly resistive (basaltic and basaltic) background marks an interesting setting for an MT experiment since faults are often related to conductive (water bearing) zones. Because of the high background resistivity, we expect a deep magnetotelluric penetration and the goal is to see how deep the fault system reaches into the crust and whether or not it reaches the mantle. If there are faults reaching through the entire crust, this may well explain some of the regional volcanic activity.

We collected data on a 30 km profile with a station spacing roughly about 2.5 km. The SW-NE orientation of the profile is perpendicular to and cuts through three NE-SW orientated fault axes. The broadband data is sampled at 128 Hz and gathered for two days with one to three stations measuring at the same time. The processed data shows clear 3D features and/or anisotropy at most sites but resembles well the high background resistivity up to tens of kOhm. The 2D inversion shows features, which are likely to be artifacts, and underscores the assumption of present 3D effects and/or anisotropy due to the fault system.