The Electrical Signature of the Manzaz and Atakor Intraplate Cenozoic Volcanism (Central Hoggar, South of Algeria).

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Volcanism occurs in several distinct geological settings. Most of these are associated with tectonic plate boundaries. In contrast, a relatively small number of volcanoes occur within plates far from their margins. The crustal and lithospheric mantle structure of such continental intraplate volcanic systems are enigmatic and the origins of volcanic activity remain controversial, which is due in part to a lack of high-resolution geophysical data. In Algeria, the intraplate volcanism is well presented in the Hoggar massif, which belongs to the Tuareg shield. This region is associated with a lithospheric swell of about 1000 km in diameter in relation with the Cenozoic volcanism occurring in several regions. The origin of this activity is nowadays debated. The Atakor/Manzaz region is located in the center of the swell. In order to define its deep structure, broadband magnetotelluric (BBMT) data from 40 stations along three intersected profiles were collected. The BBMT soundings are scattered across an area approximately 170km from east to west, and 80 km from north to south. We performed 3-D inversion of full impedance tensor and vertical magnetic field transfer function. The obtained model exhibits very complex electrical features. It highlights three electrical levels reflecting the crust and the uppermost lithospheric mantle. The upper crust is mainly dominated by a sharp resistant structure interrupted by several conductors related to the known shear zones of the area, while the middle-to-lower crust shows a very conductive character, the whole set is underlined by more or less conductive part which materializes the uppermost lithospheric mantle. The architecture formed by the conductive bodies at different depths in this model, is reminiscent of the plumbing system, and known as the Flower Structure in geology.