MAGNETOTELLURIC STUDY OF PARINACOTA AND LASCAR VOLCANOES, CENTRAL ANDES

DANIEL DIAZ, Dirk Brändlein, Heinrich Brasse

Fachrichtung Geophysik, Freie Universität Berlin, Germany

This investigation considers two regions of interest, the first one includes the zone around Parinacota (6350 m, 18°09'S, 69°08'W), a subduction related stratovolcano situated in the limit of Bolivia and Chile, which had its biggest eruptive episodes around 8000 years ago. The second zone is more to the south, around Lascar volcano (5592 m, 23°22'S, 67°41'W), located on the eastern side of the Salar de Atacama basin in northern Chile, it has been one of the most active volcanoes of the central Andes in the last years.
Between September and November 2007, magnetotelluric and audio magnetotelluric sites were built in the area close to Lascar and Parinacota volcanoes. AMT sites were installed in the proximities of the volcanoes, for a more shallow view, and the MT sites, which can reach longer periods and larger depths, were installed on a profile south of Lascar, which goes from the volcanic arc, crossing the Salar de Atacama basin, and as an outer ring in the Parinacota region.
Remote reference and robust techniques were used in the data processing. Induction arrows, phase tensor ellipses and strike direction of the conductivity distribution have been calculated for the AMT sites, showing some 3-D behavior for the shallower depths, with induction vectors at the closest sites to the volcanoes pointing away from them, influenced by the topography. For the higher periods, the behavior is more 2-D in both regions, with a more stable strike direction which is coherent with the induction vectors and the largest semi axis of the phase tensor ellipses. All these parameters show a strong influence in the higher periods which seem to be due to a large conductive anomaly in the backarc, according with other studies in the zone, under the Bolivian altiplano.
From a first analysis, deep large conductive bodies are not present in these zones around the volcanoes. Topographic corrections have been developed as well as sensitivity analysis for different cases of synthetic magmatic chambers. 2-D and 3-D models are under development.
First results of conductivity models will be presented.

Magnetotellurics, volcanoes, Central Andes

Daniel Diaz, Freie Universität Berlin, Fachrichtung Geophysik. Malteserstr. 74-100, 12249 Berlin, Germany. tel: 49-030-83870184. e-mail: d.diaz@geophysik.fu-berlin.de