

INVESTIGATING THE CENTRAL AMERICAN VOLCANIC ARC WITH LONG-PERIOD AND BROAD-BAND MAGNETOTELLURICS

Heinrich Brasse 1, Lutz Mütschard 1, Angelica Muñoz 2, Guillermo Alvarado 3, Tamara Worzewski 4

1. Freie Universität Berlin, Germany, e-mail: heinrich.brasse@fu-berlin.de
2. Instituto Nicaragüense de Estudios Territoriales, Managua, Nicaragua
3. Instituto Costarricense de Electricidad, San José, Costa Rica
4. IFM-Geomar, Kiel, Germany

A new, large-scale magnetotelluric project is currently under way to study fluid and melt-involved processes at the Central American margin. Long-period and broad-band data along three profiles have been collected so far in Costa Rica and Nicaragua in 2008 and early 2009. 2-D models of the Costa Rica project reveal significant enhanced conductivity zones beneath the forearc and the backarc (hinting at fluid release from the subducting Cocos Plate and a rise of melt behind the volcanic arc), this is not the case beneath the volcanoes itself. In contrast, while the Costa Rican data near the coast display a very large coast effect with tipper amplitudes exceeding 1, this is not the case in Nicaragua, where it almost vanishes near the Pacific Ocean. It thus has to be compensated by a large anomaly inside the continental Chortis block. The sediments of the Nicaraguan Depression reach only depths of 2-2.5 km, which is not sufficient to produce far-reaching anomalous tippers. It is evident that the arc (and also backarc) must be conductive at large depths – the volcanoes of the Maribios Range belong to the most active ones in the Americas. First 2-D models of the two Nicaragua profiles will be presented, although – at long periods – influences of 3-D structures are clearly evident. Already at this early stage of the project it may be concluded that the Central American Volcanic Arc is electrically diverse along strike, which correlates with variations in geochemical data and subduction parameters deduced from a vast range of active and passive seismological data.

Central America, volcanic arc, magnetotellurics

Heinrich Brasse, Freie Universität Berlin, Fachrichtung Geophysik, Malteserstr. 74-100, 12249 Berlin, Germany, e-mail: heinrich.brasse@fu-berlin.de