



Cities on Volcanoes 9
November 20-25, 2016
Puerto Varas, Chile

'Understanding volcanoes and society: the key for risk mitigation'



Resistivity structure of the volcanic system Paniri-Toconce, Chile

Renzo Mancini, Daniel Díaz, Karin García, María Jose Hernández and María Constanza Flores

¹Departamento de Geofísica, Universidad de Chile. Centro de excelencia en geotermia de los Andes

Keywords: Geophysics, Magnetotelluric, geochemistry, volcanic chain

The research is located in the Paniri-Toconce volcanic chain (which consists of the Toconce, Cerro de Leon and Paniri volcanoes, besides the eruptive center Lavas de Chao) in the Central Volcanic Zone of Andes, in north Chile, which is immediately to the NW of El Tatio geothermal system. The main goal in the study consists in determining the current behavior of the complex, in which the oldest volcano is Toconce with an age of 1.5 My, while Paniri and Lavas de Chao are the youngest with an age about 0.3 My. The volcanoes don't have historical eruptions but the date of the last eruption in the Paniri volcano is estimated to be one hundred thousand years ago. Thermobarometry studies made in the area show a crystallization of lavas at about 8 km depth coming from Lavas de Chao, and depths greater than 24 km coming from Toconce and Cerro de Leon. In this research 20 broadband magnetotelluric stations was measure in the vicinity of the complex. The aim is to characterize the deep conductive zones and their relationship with magmatic bodies associated with the adjacent volcanic system. It is expected to link the possible magmatic structures with the surface behavior of the volcanic chain. A dimensionality analysis was carried out, considering induction arrows, phase tensor ellipses and calculation of geoelectric strike. Afterwards, the data has been modeled in 3-D, using ModEM (Kelbert et al. 2014), according to the results of the dimensionality analysis. Finally, petrological and geochemical studies will be included. Preliminary results indicate the presence of a geothermal system to the southwest of the complex with maximum depths about 7 km, and a possible magmatic chamber in the N-E of the complex with depths large than 8 km.