



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

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



Structural control on volcanism at Calbuco Volcano and its relationship to Liqueñe-Ofqui Fault Zone

Angela Medrano¹ and Andrés Tassara¹

¹Dpto Ciencias de la Tierra, Universidad de Concepción

Keywords: Tectonics, volcanism, Calbuco, LOFZ, structural model

Calbuco Volcano (VC) is a stratovolcano located at the southern end of the transitional segment of the Southern Volcanic Zone of the Andes. It has evolved over the last ~300 ka over a basement of Miocene granitoids intruded on mafic igneous and metasedimentary rocks of Paleozoic age. The products that comprise the volcanic cone reflect a compositional evolution from basalts to acidic-andesites. This evolved composition compared to the regional volcanic context is attributed to a longer path in the crust, and increases its potential for generating explosive eruptions like the recent one occurred on April 22, 2015. Located west of the main trace of the Liqueñe-Ofqui Fault Zone (LOFZ), VC has not been directly related to this trace or with any other structural system. This contribution aims to develop a structural model based on field information that relates the basement structure with volcanic activity. The analysis of stress-strain data indicates two different solutions of transpressive stresses. The dominant stress regime has a σ_1 orientation parallel to the direction of subduction, which explains the presence of NE-SW sinistral faults with reverse NW-SE and NNE-SSW dextral faults southeastwards the volcano. The second stress regime presents a σ_1 stress direction semi-orthogonal to the trench, expressed as NW-SE sinistral structures and NE-SW reverse faults in the western sector. These results may well be related to a local partition of deformation with different preferential directions respect to the LOFZ, which together act to lift the basement block on which Calbuco Volcano is emplaced. A refined analysis of these results and their relation to the recent volcanic activity will be presented at the conference.