



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

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



## **Structural Geology of Laguna del Maule Volcanic Complex and control on the active crustal deformation, Volcanic South Zone, Chile.**

**Paulina Köhler <sup>1</sup>, Andrés Tassara <sup>1</sup>, Carlos Cardona <sup>2</sup>**

<sup>1</sup>Universidad de Concepción, Departamento de Ciencias Geológicas, Chile.

<sup>2</sup>Observatorio Volcanológico Chileno, Servicio Nacional de Geología y Minería. Rudecindo Ortega 03850, Temuco, Chile.

Keywords: Rhyolitic volcano system, structural geology, strike-slip fault system, pull-apart system.

The Laguna del Maule Volcanic Complex (CVLM) is a large and dynamic active volcanic caldera, contents a large-volume of rhyolitic deposits of which includes recent concentration of silicic eruptions during the Holocene. The CVLM has presented a seismic activity associated to cortical uplifting process with vertical deformation rates  $\sim 30$  cm/y, whose source has been modeled through InSAR, ranked the largest worldwide. This study comprises a geological-structural analysis and the geometric and kinematic description of the structures found in the CVLM, also it is considered, temporal and spatial correlating with seismic activity, bathymetry and seismic profiles made in the CVLM. The structures observed in the CVLM were classified into: principal and secondary faults systems. The first incumbent to two structures most extensive in the area, with orientations NE-SW and NW-SE, both with strike-slip displacement, dextral and sinistral, with a normal and reverse component, defined as Troncoso and Maule Fault, respectively. The secondary structures were defined as minor structures with a less extention in the study area, some of them generated by caldera collapse. It is concluded that the active structure responsible for the seismic activity of VT events reported in SW vertex of deformation source area corresponds to the trace of the active fault Troncoso, which spreads its movement to the northeast, crossing the LDM. In turn, the volcanic complex is controlled by compressional faults NW-SE direction (Maule Fault), associated with the location of more differentiated magmatism and rhyolitic volcanism explosive high volume. Therefore, the structural geometry of CVLM, consists of a strike-slip dextral-sinistral fault system and, associated structures in extensional domains of the main fault (Troncoso Fault), with incipient development of a releasing bend in the center of the basin, which is bounded by normal faults orthogonal to the main fault, inflation generated by the boiler associated with magmatic site.