



## **Analysis of the Magmatic – Hydrothermal volcanic field of Tacora Volcano, northern Chile, using passive seismic tomography**

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The results of a passive seismic tomography developed in the Tacora Volcano, northern Chile, are presented. In this area, the main thermal manifestations are fumarolic fields mainly distributed in the western flank of the volcano. Around the volcanic area were installed 17 short period seismic stations, between August and December, 2014. Using the P and S wave arrival times of the seismicity record, a 3D velocity model was determined through a passive seismic tomography. For a better visualization of low and high velocity anomalies, the Leapfrog Viewer Software has been used. The areas of high  $V_p/V_s$  values, located directly under the volcanic chain, are interpreted as fluid-saturated areas, corresponding to the recharge zone of the hydrothermal system. Meanwhile, low  $V_p/V_s$  values represent the location of a magmatic reservoir and circulation networks of magmatic-hydrothermal fluids. The final model it was contrasted with available geochemical information showing a match between the low  $V_p/V_s$  areas (magma reservoirs / hydrothermal fluids), fumarolic fields and surface hydrothermal alteration. Finally, we present a cluster analysis using the percentage variation of  $\%dV_p$ , with which we have found a method for the identification of clay level areas related with the intermediate values of  $V_p/V_s$  (1.70 – 1.75) and the degassification zones.