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Multiparameter Volcano Surveillance of Villarrica Volcano (South-Central Chile)

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Villarrica is one of the most active volcanoes in Chile and one of the few in the world known to have an active lava lake within its crater. This snow-covered volcano generates frequent strombolian eruptions and lava flows and, at times, the melting of snow can cause massive lahars.
Besides this, continuous degassing and high-level seismicity are the most common types of activity recorded at the volcano. In order to investigate the mechanisms driving the persistent degassing and seismic activity at the volcano, we use a multiparameter approach based on the combined study of high time-resolved gas and seismic data. These data are respectively acquired by means of 3 stationary NOVAC-type scanning Mini-DOAS and 7 additional seismometers (short period and broad bands), installed at the volcano since March 2009, that complement the existing OVDAS (Observatorio Volcanológico de los Andes del Sur) volcano monitoring network. On the basis of the combination of gas and seismological measurements we aim at gaining insight into volcano-magmatic processes, and factors playing a role on onset of volcanic unrest and eruptive activity.

Since the gas monitoring network has been installed at the volcano a correlation between SO2 emissions and seismic activity (LP events) has been recognized. A possible role played by regional tectonics on detected changes in volcano degassing and seismicity, and consequently on the volcanic activity, is also investigated.