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Characteristics of seismic activity of Villarrica Volcano

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Villarrica is one of the most active and dangerous volcanoes in Chile. During the last decade it consisted of a single open vent hosting an active lava lake which produced mild strombolian explosions, persistent tremor and continuous degassing.

We present an analysis of the seismic activity of Villarrica between 2010 and 2012. Periods of increased lava lake activity are characterized by numerous small transient events which exhibit a variety of waveforms and spectral characteristics. Statistical analysis of interevent times revealed a periodic occurrence. At comparable volcanic systems (Stromboli, Erebus), such distributions of events indicated unusual periods of activity corresponding to magma injection. Methods of blind signal separation (ICA, PCA) were used to analyse the wavefield. While regional and local tectonic earthquakes can easily be separated, the tremor and transient events from the crater can not.