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Sulfur dioxide (SO₂) degassing in Copahue volcano between 2014 and 2016 and its relationship with surface activity

Gabriela Velásquez¹; Oscar Valderrama^{1,2}

¹ Observatorio Volcanológico de los Andes de Sur, Servicio Nacional de Geología y Minería. Rudecindo Ortega 03850, Temuco, Chile.

² Universidad de Concepción, Departamento de Ciencias de la Tierra. Víctor Lamas 1290, Concepción, Chile.

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Since the eruption on December 2012, Copahue volcano is found in a state of instability, which manifests through continuous degasification and some periods of high phreatic activity. According to surface activity, four main periods could be distinguished between March 2014 and July 2016, two of them correspond to intense ash emission, incandescence and phreatic explosions. Continuous SO₂ measurements between 2014 and 2016, using a scanning Mini-Differential Optical Absorption Spectrometers (Mini-DOAS) instrument, showed significant increment in SO₂ concentrations before the appearance of surface activity, with daily average of 9717 and 6162 t d⁻¹. This increase in the surface activity also has been reflected in the seismic records, with an increment in real-time seismic amplitude measurements (RSAM). A long quiescence period was observed between December 2014 and September 2015; this period was characterized by an absence of ash emission and incandescence. However, due to its instability state showed continuous degassing, recording a mean of SO₂ emission of 963 ± 634 t d⁻¹. In Copahue volcano the surface activity has been directly related with the degasification process, because an increment in SO₂ emission has been observed few days before the surface activity begins, acting as a precursor. While, in rest periods SO₂ emission keeps constant.