



Satellite detection of volcanic halogens (OCIO, BrO and HCl) after the eruption of Puyehue-Cordón Caulle

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Volcanoes release large amounts of halogen species such as HCl and HBr, which can be converted into reactive halogens by heterogeneous photochemical reactions that are currently not fully characterized.

In this paper, we report on the first satellite detection of volcanic chlorine dioxide (OCIO). Measurements were performed using the SCanning Imaging Absorption spectroMeter for Atmospheric CHartographY (SCIAMACHY) instrument for the ash-laden plume emitted after the 2011 eruption of Puyehue-Cordón Caulle in Chile. We also identified volcanic BrO using the Ozone Monitoring Instrument (OMI) instrument, as well as enhanced HCl in data of the Microwave Limb Sounder (MLS) instrument. These observations suggest that OCIO was formed in the plume by the ClO+BrO reaction in presence of a large excess of ClO. The present satellite data set could help better understand reactive halogen chemistry in volcanic plumes, and its impact on atmospheric composition.