

Ultraviolet camera monitoring of SO₂ emissions from Volcan Villarrica, Chile 2012 - 2013

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Ultraviolet cameras are increasingly recognized for their unparalleled ability to image the entrainment of volcanic SO₂ into the atmosphere and to measure emissions at high temporal resolutions (1–3 Hz). A particular benefit can be in resolving emissions from multiple sources at a given volcano and partitioning the overall SO₂ budget between them. Other spectroscopic techniques such as the Correlation Spectrometer and compact UV spectrometers typically only provide an integrated measurement for all sources present.

During February to March of 2012 and 2013, high temporal resolution SO₂ degassing data were collected at Volcan Villarrica using a setup of one to three simultaneously operating ultraviolet cameras. The persistent gas plume at the dominantly basaltic to basaltic–andesitic Villarrica offers an excellent field laboratory setting to test novel instrumentation. These data were collected as part of a broader multiparameter study to characterize shallow degassing processes, and thermal and particle emissions at Villarrica. Preliminary results from these two campaigns highlight interannual variations as well as variability on weekly–daily timescales.