



## **Sulphur dioxide and bromine monoxide emission inside the volcanic plume of Reventador, Ecuador**

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Reventador volcano has been actively degassing since a paroxysmal eruption in 2002 after 26 years of quiescence. Summer and autumn 2017 were characterized by frequent ash explosions, lava- and pyroclastic flows. Despite being active for more than 15 years, not many plume gas measurements have been undertaken at Reventador volcano so far, mostly because of its remote location and cloudy climate.

We present three days of Sulphur dioxide (SO<sub>2</sub>) and bromine monoxide (BrO) slant column densities, SO<sub>2</sub> emission rates as well as BrO/SO<sub>2</sub> molar ratio inside the plume of Reventador during a field campaign from the 19<sup>th</sup> - 21<sup>st</sup> September. During the observation period, Reventador was quite active, often showing several ash explosions every hour.

We measured UV spectra using two MAX-DOAS instruments, scanning through the plume slightly downwind of the plume. The spectra are evaluated using Differential Optical Absorption Spectroscopy (DOAS).

During the first day we retrieved SO<sub>2</sub> slant column densities up to  $4 \times 10^{17}$  molec/cm<sup>2</sup> and BrO SCDs up to  $4 \times 10^{13}$  molec/cm<sup>2</sup> quickly after an explosion on two occasions, which quickly fall under the detection limit in less than 10 minutes. SO<sub>2</sub> fluxes of maximum 1 kg/s are calculated. During the second day we observe SO<sub>2</sub> SCDs varying between 2 and  $6 \times 10^{17}$  molec/cm<sup>2</sup> and BrO SCDs of  $4 - 7 \times 10^{13}$  molec/cm<sup>2</sup> throughout the whole day. SO<sub>2</sub> fluxes between 0.5 and 2 kg/s are reached and we calculate a mean daily BrO/SO<sub>2</sub> molar ratio of  $8.3 \times 10^{-5} \pm 8 \times 10^{-6}$  inside the plume.