



SO₂ retrievals from TROPOMI: towards an improved monitoring of global volcanic degassing

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Satellite remote sensing of sulfur dioxide is widely used to monitor volcanic degassing globally, in particular since 2004 with measurements from the Ozone Monitoring Instrument (OMI). In this study, we present the first SO₂ results from the TROPOspheric Monitoring Instrument (TROPOMI) which was launched onboard the Sentinel-5 Precursor (S5P) platform on October 2017. While OMI and TROPOMI have similar spectral performances, the TROPOMI instrument has a spatial resolution of 7x3.5 km², which is a factor of 12 better than OMI (13x24 km², before the OMI instrument gets affected by the so-called row anomaly issue). For a selection of degassing volcanoes, we illustrate the improved capability of TROPOMI to monitor volcanic SO₂ emissions compared to OMI. In particular, we discuss the ability of the new sensor to detect smaller volcanic sources with better accuracy and selectivity. The retrieval challenges associated with higher resolution measurements are addressed, as well as new opportunities provided by TROPOMI to estimate volcanic SO₂ fluxes, with a detection limit of about a factor of 3 better than OMI. Plans for future work including validation are presented.