



Validation of Satellite-Observed Volcanic Emissions with Ground-Based NOVAC-Measurements

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The observation of volcanic gas emissions with satellite instruments permits the long-term monitoring of the volcanic sulphur dioxide (SO₂) emissions in near-real time. Besides studying the climate and meteorological effects that huge injections of SO₂ during from volcanic eruptions or passive degassing phases may cause in the atmosphere, one can compare the degassing data with additional geophysical parameters to gain insights into chemical and geological processes occurring inside volcanoes.

Next to the continuous long-term data set, another crucial advantage of the satellite measurements is the availability of data at inaccessible volcanoes, where ground-based measurements are impossible or dangerous to carry out. However, it is of key importance to validate satellite remote sensing data with ground-based measurements (where they are available) in order to implement a reliable and accurate vertical column density retrieval. While such validation has proven non-trivial in the past due to the differences in viewing geometry and observed spatial scales between ground-based and satellite measurements, the recent availability of a global network of ground-based volcanic gas emission measurements together with novel satellite instrumentation now provides the necessary framework to advance such efforts.

Since its start in 2005, ground-based DOAS measurements of volcanic gas emissions have been conducted in the scope of the NOVAC (Network for Observation of Volcanic and Atmospheric Change) project. The project database now offers vast amounts of ground-based measurement data from numerous volcanoes on four different continents. Combined with the improved spatial resolution of novel satellite instruments, the data offers new possibilities for validation of satellite retrievals. Here we present first results of comparisons of volcanic SO₂ emission measurements from the GOME-2 instrument on MetOp with ground-based data from the NOVAC network.