Geophysical Research Abstracts
Vol. 14, EGU2012-14451, 2012
EGU General Assembly 2012

Atmospheric measurements of volcanic eruptions with the infrared sounder IASI (Arne Richter Award for Outstanding Young Scientists Lecture)

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Due to their spatial coverage, satellite sounders are ideal for measuring volcanic emissions. They are able to monitor (dormant) volcanoes in remote parts of the world and measure large plumes from explosive eruptions. Currently over a dozen instruments (operating in the IR and UV spectral ranges) are capable of detecting volcanic ash and/or sulphur dioxide. Satellite measurements are highly relevant for hazard mitigation, locally but also on large scales for air traffic avoidance of volcanic clouds. Their coverage enables to establish an accurate time-record of global volcanic emissions. This is useful from a volcanology perspective, but also for assessing the global climate impact of volcanic emissions.

In this talk we give an overview of four years of measurements of large eruptive plumes from the high resolution infrared atmospheric sounding interferometer (IASI). The focus is on the detection and measurement of volcanic aerosol (volcanic ash, ice and sulphuric acid). In the second part of this talk, we discuss sulphur dioxide measurements and the recent first observations of hydrogen sulphide. We conclude with a discussion of open problems and challenges which lie ahead for the remote sensing of volcanic products.