Geophysical Research Abstracts
Vol. 13, EGU2011-9618, 2011
EGU General Assembly 2011

Satellite and ground-based measurements of volcanic emissions during the Merapi 2010 eruption crisis

Fred Prata (1), Marie Boichu (2), Simon Carn (3), Lieven Clarisse (4), Elizabeth Ebert (5), Andrew Prata (5), and Andrew Tupper (5)

(1) Norwegian Institute for Air Research (NILU), Atmosphere & Climate Change, Kjeller, Norway (fred.prata@nilu.no), (2) Cambridge University, UK, (3) Michigan Technological University, USA, (4) Free University of Brussels, Belgium, (5) Bureau of Meteorology, Australia

In November 2010, Merapi volcano erupted ash and SO2 into the atmosphere which were detected by several satellite sensors, including the high spectral resolution AIRS and IASI polar-orbiting instruments. In the early phase of the eruption ash was difficult to detect due to masking by meteorological clouds, but extensive SO2 emissions were detected and tracked using both infrared and ultra-violet sensors. The difficulty of detecting ash from satellite measurements in moisture-laden atmospheres demonstrates the need for a better integrated measurement capability, and the need for high-temporal frequency high-spectral resolution satellite measurements (e.g. geosynchronous spectrometers and interferometers) and improved active remote sensing data (e.g. lidar and radar) that are capable of penetrating clouds. Ground-based SO2 measurements were made using the DOAS technique to monitor gaseous emissions, and these data can also be used for validation of the satellite measurements. The Australian Bureau of Meteorology, Volcanic Ash Advisory Centre provided aviation advisories during the crisis and made use of satellite data as well as dispersion modelling as input information. These data have been re-analysed to provide an overview of the impact of the Merapi emissions locally and regionally, including the effects on aviation. Results of these analyses will be presented and important conclusions drawn concerning on the utility and timeliness of ash and SO2 remotely sensed measurements for managing volcanic crises in persistently cloudy regions.