



An integrated multi-sensors approach for volcanic cloud retrievals and source characterization

stefano corradini and luca merucci

Istituto Nazionale di Geofisica e Vulcanologia (INGV), CNT, Rome, Italy (stefano.corradini@ingv.it)

Volcanic eruptions are one of the most important sources of natural pollution. In particular the volcanic clouds represent a severe threat for aviation safety.

Worldwide the volcanic activity is monitored by using satellite and ground-based instruments working at different spectral ranges, with different spatial resolutions and sensitivities.

Here the complementarity between geostationary and polar satellites and ground based measurements is exploited, in order to significantly improve the volcanic cloud detection and retrievals and to fully characterize the eruption source. The integration procedure named MACE (Multi-platform volcanic Ash Cloud Estimation), has been developed during the EU-FP7 APhoRISM project aimed to develop innovative products to support the management and mitigation of the volcanic and the seismic crisis. The proposed method integrates in a novel manner the volcanic ash retrievals at the space–time scale of typical geostationary observations using both the polar satellite estimations and in-situ measurements. On MACE the typical volcanic cloud retrievals in the thermal infrared are integrated by using a wider spectral range from visible to microwave. Moreover the volcanic cloud detection is extended in case of cloudy atmosphere or steam plumes.

As example, the integrated approach is tested on different recent eruptions, occurred on Etna (Italy) in 2013 and 2015 and on Calbuco (Chile) in 2015.