

## **A Multi-platform approach for volcanic ash detection/retrieval and eruption characterization**

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The volcanic eruptions represent one of the most important sources of natural pollution. The volcanic clouds detection and retrievals is important because of their effects on the environment, climate, public health and to aviation. In particular it is well known that the volcanic ash clouds represent a severe threat for aviation safety in particular because it can cause the failure of the turbine engines. Today the volcanic activity is monitored worldwide by using satellite and ground-based instruments. To date, doesn't exist a single system able to give a comprehensive description of a particular phenomenon, then a multi-sensor approach is needed.

Here, the complementarity between geostationary, polar satellite sensors and ground based measurements has been exploited to improve the ash detection and retrieval and to fully characterize the volcanic ash clouds from the source to the atmosphere. The proposed method integrates the volcanic ash retrievals at the space-time scale of typical geostationary observations using both the polar satellite estimations and in-situ measurements. The volcanic ash thermal infrared (TIR) retrievals are integrated by using a wider spectral range from visible (VIS) to microwave (MW) and the ash detection will be extended also in case of cloudy atmosphere or steam plumes. This integrated approach has been tested on different recent eruptions, representative of different eruption styles in different clear or cloudy sky conditions.