

Advanced Procedure for volcanic and Seismic Monitoring (APhoRISM)

Call SPA.2013.1.1-07 “Remote sensing method”

Abstract

APHORISM project proposes the development and testing of two new methods to combine Earth Observation satellite data from different sensors, and ground data. The aim is to demonstrate that this two types of data, appropriately managed and integrated, can provide new improved GMES products useful for seismic and volcanic crisis management.

The first method, APE – A Priori information for Earthquake damage mapping, concerns the generation of maps to address the detection and estimate of damage caused by a seism. The use of satellite data to investigate earthquake damages is not an innovative issue. We can find a wide literature and projects concerning such issue, but usually the approaches are only based on change detection techniques and classifications algorithms. The novelty of APE relies on the exploitation of a priori information derived by InSAR time series to measure surface movements, shakemaps obtained from seismological data, and vulnerability information. This a priori information is then integrated with change detection map to improve accuracy and to limit false alarms.

The second method deals with volcanic crisis management. The method, MACE - Multi-platform volcanic Ash Cloud Estimation, concerns the exploitation of GEO (Geosynchronous Earth Orbit) sensor platform, LEO (Low Earth Orbit) satellite sensors and ground measures to improve the ash detection and retrieval and to characterize the volcanic ash clouds. The basic idea of MACE consists of an improvement of volcanic ash retrievals at the space–time scale by using both the LEO and GEO estimations and in-situ data. Indeed the standard ash thermal infrared retrieval is integrated with data coming from a wider spectral range from visible to microwave. The ash detection is also extended in case of cloudy atmosphere or steam plumes.

APE and MACE methods have been defined in order to provide products oriented toward the next ESA Sentinels satellite missions.

APhoRISM team:

Participant no.	Participant organisation name	Country
1 (Coordinator)	Istituto Nazionale di Geofisica e Vulcanologia	Italy
2	Consorti Institut de Geomàtica	Spain
3	Bureau de Recherches Géologiques et Minières	France
4	Department of Information Engineering, Electronics and Telecommunications, Sapienza University of Rome	Italy
5	Gamma Remote Sensing Research and Consulting AG	Switzerland
6	University of Oxford, Physics department, AOPP	United Kingdom
7	ALMA Sistemi sas di DI IORIO Alessio & C	Italy