

EARTH OBSERVATION SYMPOSIUM (B1)  
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THE COSMO-SKYMED CONSTELLATION MONITORING OF THE ITALIAN TERRITORY: THE  
MAP ITALY PROJECT**Abstract**

COSMO-SkyMed (COntstellation of small Satellites for the Mediterranean basin Observation) represents the largest Italian investment in Space System for Earth Observation, commissioned and funded by Italian Government. The COSMO-SkyMed constellation consists of four Low Earth Orbit (LEO) mid-sized satellites, each equipped with a multi-mode, high-resolution and polarimetric X-band Synthetic Aperture Radar (SAR) that allows to acquire information on ground deformations and type of existent surfaces, over wide portions of land, during night and day and regardless of weather conditions. Starting from the launch of the first satellite in 2007, COSMO-SkyMed has proved to be a useful and very efficient instrument of monitoring in case of emergencies. It has indeed been used in case of landslides, floods, volcanic eruptions, earthquakes and whatever could be of interest for Civil Protection, such as environment and climate monitoring, disaster and risk management, surveying coastlines and hydrogeological resources. Nevertheless, COSMO-SkyMed represents a fundamental contribution in the monitoring of the National territory, being able to acquire up to 1800 images per day. Based on specific needs of the Italian Premiership – Department of Civil Protection, the Italian Space Agency (ASI) activated a full interferometric mapping service of the whole National territory based on every-16 days Stripmap Himage acquisitions, both in Ascending and in Descending orbit direction, using the COSMO-SkyMed system. Thanks to this project, called Map Italy, historical series of images are acquired on the Italian territory in order to use them for interferometric analysis of instability phenomenon and endogenous risk of the same territory (landslides, subsidence, seismic and volcanic phenomenon, etc.) and to routinely and intensively populate a specific interferometric historic archive as a National geographic reference. Due to the strategic importance of Map Italy project, it was agreed to increase the priority level of this interferometry mission, which started as a “background mission” and is now a “foreground mission”. The Map Italy data archive has proven invaluable for tracking ground deformation and surface change. This paper aims to highlight the proven usefulness and benefits of Map Italy project, discovering the variety of its reference users, (either institutional or private sector at national and international level), and giving an overview of some emergency case studies caused by natural or human-produced damage for which the utilization of Map Italy data has been of primary importance. The results obtained thanks to the availability of this kind of catalogue will be presented, as well.