

EARTH OBSERVATION SYMPOSIUM (B1)  
Future Earth Observation Systems (2)

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## THE FUTURE EO ASI MISSIONS ARE BASED ON SAR AND HYPERSPECTRAL SENSORS

**Abstract**

In the last decade ASI (Agenzia Spaziale Italiana) invested significant effort in two main technology fields of the Earth Observation: X-band SAR and hyperspectral sensor. COSMO-SkyMed constellation has been deployed between 2007 and 2010 and now it represents a focal asset in the current Earth Observation scenario. With the aim to guarantee continuity in the SAR data exploitation and to develop new sensors to be available to the users, ASI is developing two new Earth Observation systems: COSMO-SkyMed Seconda Generazione (CSG) and PRISMA (PRecursore IperSpettrale della Missione Applicativa). The former is a constellation of two satellites. It aims at improving the quality of the imaging service, providing the end users with enhanced capabilities in terms of higher number of images and image quality (larger swath and finer spatial and radiometric resolution) with respect to the current COSMO-SkyMed. Moreover it provides additional capabilities (e.g. full polarimetric SAR acquisition modes) granting a greater operative versatility both in terms of programming capability and the effective sharing of the system resources among different typologies of users requesting images of different characteristics. The latter is an Earth Observation system composed of a single satellite with innovative electro-optical instrumentation which combines an hyperspectral sensor with a panchromatic, medium-resolution camera, capitalises ASI investments in the field of small missions (e.g. AGILE), hyperspectral payloads (e.g. Hypseo, Joint Hyperspectral Mission/JHM), satellite platforms (MITA) and tracking and remote sensed data processing centres (COSMO-SkyMed and CNM – Multi-mission National Centre). CSG mission has been conceived, according to the requirements stated by ASI and Italian Ministry of Defence, at the twofold need of ensuring operational continuity to the currently operating “first generation” constellation, while achieving a generational step ahead in terms of functionality and performances. In order to ensure operational continuity, the new CSG satellites will be ready for operations timely to replace the previous generation satellites whenever they are being progressively phased out at the end of their

lifetime, starting from 2015 onward. The main objectives of the PRISMA mission are the implementation of an Earth Observation pre-operative mission, the in-orbit demonstration and qualification of an Italian state-of-the-art hyperspectral/panchromatic technology and the validation of end-to-end data processing able to develop new applications based on high spectral resolution images. The launch is scheduled in 2014. In the next future ASI will make available to the users new sets of data based on X-band SAR and hyperspectral sensor.