

EARTH OBSERVATION SYMPOSIUM (B1)
Poster Session (P)

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FROM COSMO-SKYMED TO COSMO SECONDA GENERAZIONE: EVOLUTIONS AND
PERSPECTIVES

Abstract

In the last decade ASI (Agenzia Spaziale Italiana) invested significant effort in earth observation (EO) field by means of the operational COSMO-SkyMed radar satellites constellation and the developing of its follow-on called COSMO-SkyMed Seconda Generazione. Both are dual-use systems for civilian and defense use resulting from an agreement between the Agenzia Spaziale Italiana, the Italian Ministry of Defense and the Italian Ministry of Research. COSMO-SkyMed spacecraft constellation was stepwise deployed from 2007 to 2010, with launch and commissioning of four satellite embarking a Synthetic Aperture Radar (SAR) operating in X-band, for Earth observation high resolution radar imaging. Successively the COSMO Seconda Generazione program has been taking place since 2010, pursuing the twofold need of ensuring operational continuity to the first generation constellation, currently operating in orbit, while achieving a generational step ahead in terms of functionality and performances. From the performance point of view the COSMO Seconda Generazione constellation aims at improving the quality of the imaging service, providing the End Users with new enhanced capabilities in terms of higher number of equivalent images and of increased image quality (larger swath and finer spatial and radiometric resolution) with respect to the first generation, along with additional capabilities (e.g. full polarimetric SAR acquisition mode) and a better operative versatility in programming and sharing the system resources among different typologies of users requesting images of different characteristics, including first generation ones. In order to ensure operational continuity, the two COSMO Seconda Generazione 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 2016 onward. Moreover a smooth transition from COSMO-SkyMed to COSMO Seconda Generazione will be guaranteed through an integrated system accounting of both new COSMO Seconda Generazione and old COSMO-SkyMed capabilities, meaning that COSMO-SkyMed services provided to users will be granted as if a unique constellation is operating. This paper aims to present the state of the COSMO-SkyMed mission and its evolution in the next years, giving an overview of the COSMO Seconda Generazione mission. Continuity and differences implemented to satisfy user needs are highlighted.