

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

Author: Dr. Rino Lorusso  
Italian Space Agency (ASI), Italy

Dr. Luca Fasano  
ASI - Italian Space Agency, Italy

Mr. Luigi Dini  
ASI - Italian Space Agency, Italy

Dr. Claudia Facchinetti  
Agenzia Spaziale Italiana (ASI), Italy

Dr. Giancarlo Natale Varacalli  
ASI - Italian Space Agency, Italy

## "COSMO-SKYMED DI SECONDA GENERAZIONE" - CIVILIAN PRODUCT SPECIFICATIONS

**Abstract**

COSMO-SkyMed di seconda generazione (CSG) programme has been taking place since 2010, funded by the Italian Space Agency (ASI) and the Italian Ministry of Defence. CSG system is the follow-on mission to COSMO-SkyMed (CSK) currently operating in orbit with overall space capacity relied on four Earth observation SAR satellites. The two CSG follow-on satellites aim at providing operational continuity to CSK with increased performance, flexibility and ability to respond to updated civilian and defence user needs. The CSG programme has closed the mission critical design review, and it is foreseen that the satellites will be launched in 2019 and 2020. An overview of CSG products characteristics is reported in this paper. Different high resolution products are implemented using the spotlight civilian acquisition modes: spotlight 2a, spotlight 2b, spotlight 2c, all mode operating in single or dual polarization. Moreover, there is the possibility to perform all the spotlight acquisitions with the satellite in a "squinted" (we mean "pitched") attitude, and the new multi-swath operation modes DI2S spotlight 2 based on both SAR and platform agility. The scansar modes of CSK is significantly improved towards the scansar -1 and -2 modes of CSG, having the same swaths but enhanced geometric and radiometric quality and dual polarization. The basic stripmap product is available in single or dual polarisation featuring the same resolution and swath width of CSK. Furthermore, CSG have a full stripmap quad-polarisation mode able to estimate the full polarimetric characteristics of a target area. In continuity with CSK a multi-polarisation stripmap image can also be acquired using the ping-pong mode, which is a "burst polarimetric" mode. SAR standard products are generated starting from input data acquired by the above mentioned instrument modes. They are classified in five levels of processing (from 0 up to level 1d), considered applicable independently on the instrument mode. The paper highlights the basic features of each standard SAR CSG products, concerning with sample informations, projections, basic and special processing step performed to generate them, the expected image quality specifications. Also SAR CSG Non-Standard product (quick-look, speckle filtered, co-registered, interferometric, coherence, DEM, mosaicked, cropped products) specifications are provided to establish the intended purpose of each product, to answer the questions of the novice user, and to inform the experienced user of key characteristics of SAR Non-Standard products.