Results of the SAOCOM Commissioning Phase independent calibration and validation activities

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Abstract

The Argentine Microwave Observation Satellite SAOCOM 1A has been designed, produced, tested and operated by Argentinians within the framework of the National Space Plan. The mission, bringing into space a complex Earth observation technology, is one of the most challenging technological projects ever developed in the country. SAOCOM (Satélite Argentino de Observación COn Microondas, Spanish for Argentine Microwaves Observation Satellite) is an Earth observation satellite constellation of Argentina's space agency CONAE. The first of two satellites has been launched on 8th October 2018, while the second one is planned to be launched in 2020.

The SAOCOM satellite carries on board a full polarimetric L-band Synthetic Aperture Radar instrument, with the goal to provide timely information in support of natural and anthropogenic disaster management (such as regional flooding, volcanic eruptions, Earth quakes, landslides, forest fires, etc.), and to conduct monitoring services for agriculture, mining and ocean applications - including monitoring surveys of Antarctica (study of continental glacier evolution, global change indicators, etc.). To meet such goals the calibration activities carried out during the Commissioning Phase of the mission and the SAOCOM Level-1 products certification are of the utmost importance.

In the framework of the SAOCOM development activities Aresys provided the SAOCOM SAR Processor (SSP), which is operationally used to ingest Level-0 data and process them into the official Level-1 products. Furthermore, during the SAOCOM Commissioning Phase, Aresys performed an independent assessment of the overall SAR system calibration. In particular the independent calibration activities included:

• The determination of the sensor pointing along-track (through the Doppler Centroid estimates) and across-track (with the dedicated Elevation Notch acquisitions)

• The analysis of images with point targets to verify the Impulse Response Function and to assess the absolute calibration of the system

• The analysis of images acquired over the Rain Forest to assess the relative calibration of the images in terms of Elevation Antenna Pattern and beam-to-beam radiometric offsets.

The presentation at the workshop will provide a brief overview of the SAOCOM mission and

will show the results obtained during the SAOCOM SAR system independent Commissioning Phase calibration and validation activities.

Keywords - Calibration methodology and techniques