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SARSAT ARABIA: EARTH OBSERVATION CONSTELLATION FOR THE MENA REGION

Abstract

SARsat Arabia is a proposed commercial Synthetic Aperture Radar (SAR) satellite constellation dedicated to the MENA region with high temporal (4 Hrs.), and spatial resolution (sub 0.5 m, spot mode). A drone-compatible prototype (MiloSAR-plus) has been developed as a pathfinder instrument. The motivation behind it is to allow refining SARsat constellation hardware specifications based on end-user information needs. MiloSAR-plus is an airborne instrument, fully polarimetric, and dual-band (S and X) system capable of sub-meter resolution, using an FMCW waveform. SAR data are commonly available across the globe, but there is a growing demand for specific capabilities associated with such active sensors. For example, Interferometry SAR, Quad Polarization, and data controllability are among MENA end-user demand. Moreover, the information contained in SAR images has still been generally unlocked; the end-user is interested in insights (information) instead of a pure image (data). For example, oil tankers operator wants to detect possible initial spills that may happen in the international waters before it reaches shores. Therefore, avoiding environmental disaster, and or a costly fine. A set of use cases has been developed in the fields of Agriculture, Oceanography, Geology, Land and Sea surveillance, Pipeline Monitoring, Urban Development and Cartography, and experimental campaigns using the airborne sensor defined. Interested MENA end-users will be approached to work with the SARsat team to refine their needs, using real data taken by the MiloSAR-plus. This will include the hardware optimization for each use case. The timeliness (how often, delay from data acquisition to information availability) will be projected to a satellite constellation. The next milestone is to set up the spaceborne design of the SAR payload in terms of the swath, polarization, and band selection. Paving the way for a demo mission: Arabia Eye D-1, the first commercial Earth Observation satellite in the region. This milestone will contribute to enhancing the UAE's leadership in space hardware technologies for Earth Observation and its national plan to promote space investments. Moreover, the National Space Science and Technology Center (NSSTC) will get access and control of SAR data to allow providing data-driven solutions to environmental/ economic challenges countering the MENA region.