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

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NEXT GENERATION OF SAR SERVICES: CAPABILITIES AND APPLICATIONS OF WORLDSAR

Abstract

The Earth Observation environment is changing rapidly, the market is consolidating and a lot of constellations (optical, radar or mixed) are announced, driven by privately funded initiatives and new entrants. Increasing information requirements – reflected by a trend towards cloud-based data analytics - implicitly require synergies between optical and radar imagery (such as maritime, oil and gas, or GeoInt), and new service and quality level. As a consequence and the demand of unprecedented high resolution (¡ 25 cm), and large area coverage (from 50 cm – 1 m) is expected to become a market driver.

1. Program Evolution A rising number of applications that provide valuable socio-economic benefits require higher resolution and coverage capability than the market offers today. Following the bandwidth extension by the ITU at the last WRC15 in Geneva, this higher resolution is now possible. The WorldSAR concept, based on the HRWS (High Resolution Wide Swath) satellite, aims to address user needs by adding a very high resolution capability, up to 0.25 m, large area maritime surveillance, with specific maritime modes, and high revisit. This achievement leads to an improvement of 16 time of the resolution.

2. WorldSAR Capabilities Launched in 2007, the TerraSAR-X mission provides X-Band data and services on an operational basis. Recent improvements and evolutions of the program comprise the introduction of new SAR imaging modes and the upcoming constellation with the Spanish PAZ satellite. WorldSAR, implemented as a commercial and civil program, is intended to be composed by the HRWS satellite, the next step in the German X-Band SAR roadmap, and partners, and is designed to guarantee the TerraSAR-X data and service continuity for commercial and public end-users well beyond the year 2030. WorldSAR will bring improved system capabilities compared to the current mission in all different components.

3. Main applications WorldSAR aims to provide an increased areal coverage and unprecedented resolution, benefiting to applications such as surface motion monitoring, maritime and environmental monitoring, oil and gas, and Defence. Achieving 25cm resolution with a high signal quality (improved SNR) will help institutions, public and private customers to better monitor their territories and infrastructures.

4. Conclusion The paper will present the new applications that this mission will make possible, with an increase of the resolution in X-Band radar. The paper will also present the objectives and the characteristics of WorldSAR, unique from a technological and commercial point of view.