

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

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## TERRASAR-X NEXT GENERATION – MISSION OVERVIEW

**Abstract**

The TerraSAR-X Next Generation (TerraSAR-X NG) mission, implemented as commercial and civil programme, constitutes the next step in the German X-Band SAR roadmap and is designed to guarantee the TerraSAR-X data and service continuity for commercial and public end-users beyond the year 2016. With new very high-resolution products and improved performance parameters the TerraSAR-X follow-on mission will provide new products and services to the user community while remaining heritage products.

The TerraSAR-X Next Generation (TerraSAR-X NG) system will be composed of a Space Segment with TerraSAR-X NG satellite(s), Telemetry, Tracking & Command (TT&C) and reception stations, a core Ground Segment and a Service Segment including Direct Access Stations (DAS). The Space Segment is initially based on a single spacecraft to be launched into the TerraSAR-X reference orbit while the TerraSAR-X system is supposed to be still operational.

The TerraSAR-X NG system provides an operational system lifetime of at least 9 years. Most relevant improved system capabilities compared to the current TerraSAR-X mission are the provision of new imaging modes and improved performance. Main new mode will be a very high resolution mode of up to 0.25 m resolution at improved NESZ ( $< -23\text{dB}$ ). Besides that, the TerraSAR-X NG mission will provide new large area coverage TOPS modes with a swath width of up to 400 km and a dedicated ship detection mode, particularly to foster maritime applications. Furthermore, operational full polarimetry providing cross, dual and quad polarization will be available. As another key improvement the system will demonstrate improved system responsiveness and NRT capabilities, e.g. through utilisation of a network of main and external ground stations including polar station(s). The spacecraft will accommodate an AIS receiver as secondary payload complementing the SAR Mission in order to extend ship detection capabilities based on SAR imagery.

The TerraSAR-X NG mission and potential extensions will be subject to a partnership model, “World-SAR”, in which partners can participate through co-investment, subscription, and up to ownership of additional satellites operated in constellation. Constellation capabilities are currently being implemented enabling interoperability with the on-going TerraSAR-X mission and the Spanish PAZ mission.

The paper aims at presenting the objectives and the characteristics of the TerraSAR-X NG programme and especially to describe the last achievements undertaken making this mission unique from a

technological and commercial point of view.