The TerraSAR-X and TanDEM-X Missions

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TerraSAR-X is a new German radar satellite that was launched in June 15, 2007. Its lifetime will be five years. It carries a high frequency X-band SAR sensor that can be operated in three different modes and various polarizations. The Spotlight-, Stripmap- and ScanSAR-modes provide high resolution images for detailed analysis as well as wide swath data whenever a larger coverage is required. These high geometric and radiometric resolutions together with the single, dual and quad-polarization capability are innovative and unique features with respect to space borne systems. Additionally several incidence angle combinations will be possible and double side access can be realized by satellite roll maneuvers. The satellite is positioned in a sun-synchronous 11 days repeat orbit. The revisit time in the very high resolution Spotlight mode is 2.5 days for 95% Earth's surface visible to TerraSAR-X.

TerraSAR-X is an operational SAR-system for scientific and commercial applications, owned by the state of Germany. The commercial exploitation is exclusively granted to Astrium / Infoterra GmbH. The German Aerospace Centre DLR is responsible for the scientific utilization of the TerraSAR-X products. The status "scientific use" needs to be gained via a selection process. The Science Service System (http://sss.terrasar-x.dlr.de/) was developed for this purpose. Since end of October new proposals can be submitted at any time. The corresponding TerraSAR-X data will be provided to the costs of fulfilling the user request. Further Announcements of Opportunity (AOs) are planned where special conditions might be applied with respect to the data provision.

In October 2009 the TerraSAR-X satellite (TSX) will be supplemented by the TanDEM-X satellite (TDX) both being identically in construction. From then on, they will fly in a close formation for at least 3 years enabling single pass interferometry. The orbits of both satellites will be maintained in way that a collision of both satellites is excluded. The main mission goal is the generation of a global elevation model with an accuracy, which was never possible in earlier missions: an absolute height error of 10m and a relative height error of 2m for 90% of the data. The horizontal grid will measure 0.4arc-seconds in longitude, resp. approximately twelve by twelve meters. The absolute horizontal accuracy of 10m (CE90) will be achieved mainly by the precise timing and orbits of the SAR sensors.

The TanDEM-X mission (like TerraSAR-X) is performed in a close collaboration with Astrium / Infoterra. Products will be provided by the DLR for scientific purposes while Infoterra serves the commercial and operational market. The data access mechanisms established for TerraSAR-X will be applicable for TanDEM-X, too.

The presentation will provide an overview about both missions.