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DLR and Astrium sign contract for German satellite TanDEM-X

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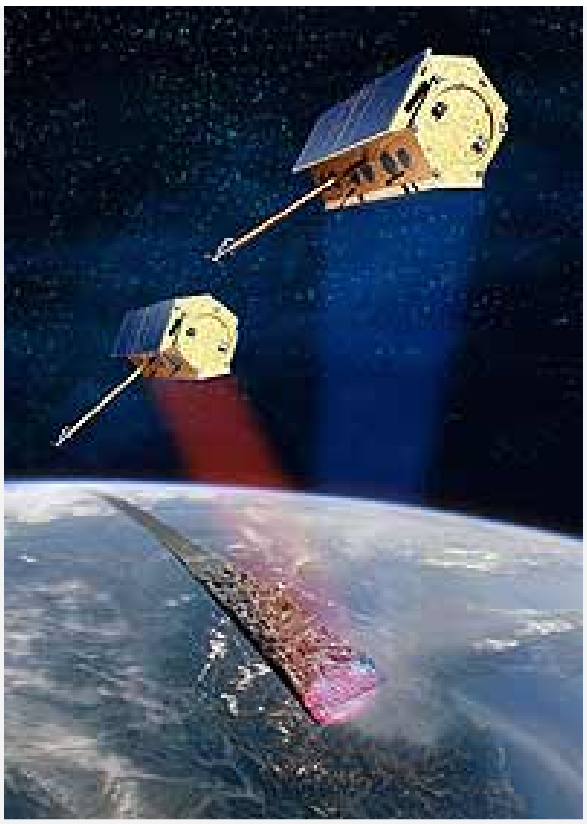
The German Aerospace Center (DLR) and one of Europe's leading satellite manufacturers, Astrium GmbH, signed a cooperation agreement and contract today at the German Space Agency in Bonn for building the satellite TanDEM-X. The agreement marks a continuation of the successful public-private partnership between DLR and industry established under the TerraSAR-X project. TanDEM-X ('TerraSAR-X add-on for Digital Elevation Measurement') is an Earth-observing radar satellite system. The spacecraft is due to launch in 2009 and is designed for 5 years of operation.

Earth observation in a two-for-one formation



The TanDEM-X satellite

Together with the almost identical satellite TerraSAR-X, scheduled for launch in October 2006 from the Baikonur space centre, TanDEM-X will circle the Earth in close formation flight. By means of this two-for-one constellation, it will be possible to completely survey the Earth's land surface (150 million square kilometres) within only three years. One goal will be the production of a global Digital Elevation Model having unprecedented accuracy. For example, for a designated 12-meter raster, or measurement scale, which is about the width of a highway, the system will deliver elevation data that is accurate up to 2 meters.

Benefiting the state and industry: a public-private partnership

The agreement signed today stipulates the rights and obligations of DLR and Astrium as well as project financing and the usage of data from TanDEM-X. The partners agreed to finance the almost-85-million-euro satellites jointly as a public-private partnership, with DLR contributing 56 million euro and Astrium investing 26 million euro; 3 million euro is expected to be generated through resale of excess payload capacity on the satellites.

Use of the data for scientific applications will be the responsibility of DLR's Microwaves and Radar Institute. Commercial marketing of the data will be managed by Infoterra GmbH, in Friedrichshafen, Germany, a 100-percent subsidiary of Astrium. In return, the company will accept part of the operating costs of the satellites depending on total revenue.

Sharing responsibilities between DLR and Astrium

According to the agreement, DLR's Space Agency is charged with overall project management responsibility for TanDEM-X. In addition, DLR is responsible for the establishment of the ground segment. Routine mission control of the two satellites, data receipt, archiving and distribution, as well as the generation and calibration of the global Digital Elevation Model will be managed by DLR's control centre, the DLR Remote Sensing Technology Institute, the German Remote Sensing Data Center and DLR's Microwaves and Radar Institute; the latter also holds responsibility for running the ground segment. DLR will also undertake the 5-year operation of the satellites.

Astrium GmbH will be responsible for the development, construction and launch of TanDEM-X. Engineers in Friedrichshafen have already begun work on the satellite.

Improved geodesy via satellite technology

Contract signing for the construction of TanDEM-X

The crucial advantages of satellite-based Earth surveying technology will enable the production of an accurate worldwide elevation model. The data thus gathered will suffer neither from heterogeneities nor data breaks at political or other artificial borders, which often develop from varying survey procedures used in different jurisdictions or from survey campaigns separated by time. The use of space-based radar will play a crucial role, since remote sensing can continue independent of weather or clouds, day and night.

The planned radar surveying procedure is at present unique in the world and has received considerable attention from other countries, in particular the USA. TanDEM-X is thus a cornerstone project that demonstrates and cements Germany's technological capabilities and competitiveness in satellite-based radar technology.

Starting in 2010, Germany will have at its disposal a high-quality global Digital Elevation Model of the Earth, which will be an attractive and unique data product that can be applied to Earth observation programs and initiatives. For instance, the data could be used by the Center for Satellite Based Crisis Information (ZKI) as well as by activities undertaken as part of the GMES (Global Monitoring for Environment and Security) initiative. GMES is a joint initiative of the European Commission and the European Space Agency (ESA) focussed on global environmental and safety monitoring.

The twin satellite: TerraSAR-X

TerraSAR-X is high-resolution radar satellite operating in the X-band (9.65 GHz), which is to be launched on 31 October 2006 for a planned 5-year mission. It will circle the Earth at an altitude of approximately 500 kilometres in a polar orbit. Using a modern radar sensing system based on a Synthetic Aperture Radar (SAR), TerraSAR-X will deliver new, high-quality remote sensing data. A SAR works by emitting multiple short bursts of radar signals in order to produce a highly accurate 'snapshot'

image. The Earth's surface reflects these signals, and the radar echoes are then received back at the satellite's antenna and stored. After complex digital processing of the received signals, radar images having a resolution of up to a meter can be generated and made available for scientific and commercial applications. TerraSAR-X is the first German satellite developed through a public-private partnership (or PPP) between DLR and Astrium. Under this type of co-operative effort, both parties provide part of the financing to build the system.

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