

The TerraSAR-X Mission: A German Public-Private Partnership Undertaking

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Vienna, February 20, 2006

Agenda

- Introduction
- Public-Private-Partnership
- Mission Design
- Data Availability
- Project Status
- Outlook

Introduction

- National, German Radar-Satellite
 - High geometric resolution
 - Flexible operational modes
 - Multi-Polarisation → high information content

- Scientific and commercial Applications
 - cartography and planning
 - agriculture and forestry
 - environment
 - risk management and security
 - geology, mining and exploration

- Launch: Summer 2006

TERRA SAR X



SRTM



SIR-C/X-SAR

Public-Private Partnership



TerraSAR-X is the first space-mission in Germany (in Europe?, worldwide?) to be implemented in a public-private partnership scheme

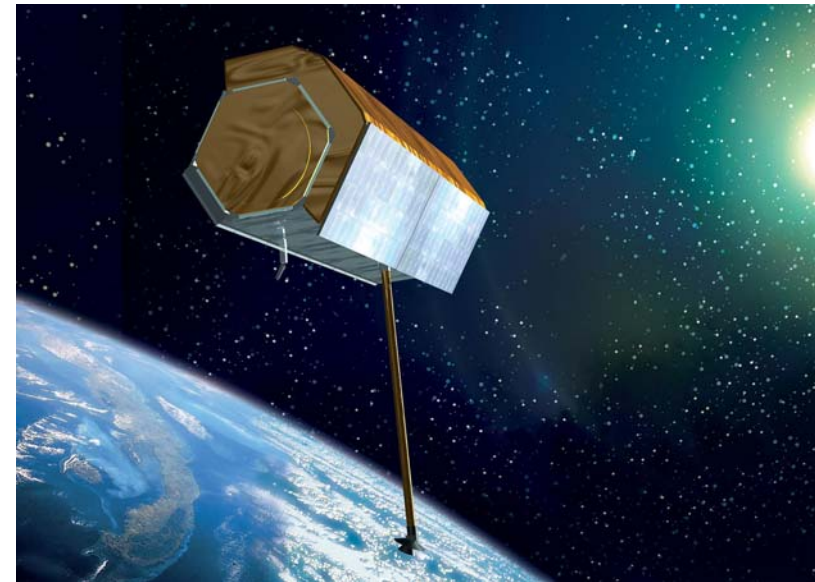
➤ Cooperation Agreement (PPP-contract)

➤ DLR ↔ EADS Astrium GmbH

➤ Scientific Exploitation:



➤ Commercial Exploitation:



Public-Private Partnership (2)



- Cooperation-agreement defines the tasks and obligations of DLR and EADS Astrium:
 - EADS Astrium GmbH contributes funds for implementing TerraSAR-X
 - Exclusive commercial exploitation rights for EADS Astrium GmbH / Infoterra GmbH
 - DLR coordinates the scientific utilization of TerraSAR-X Data
 - Satellite tasking will be shared equally 50/50 (scientific/commercial)
 - In case of conflict commercial order will have priority
 - DLR is the owner of all TerraSAR-X data



- If commercially successful → TerraSAR-X2 (to be financed by industry)

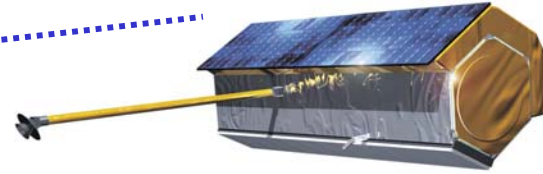
TerraSAR-X Mission-Design



514 km Orbit



DNEPR-1



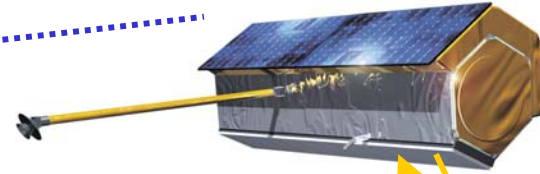
TerraSAR-X Mission-Design



514 km Orbit



DNEPR-1



Data

Cmd & Tlm



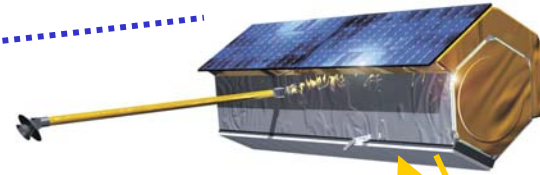
TerraSAR-X Mission-Design



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Data

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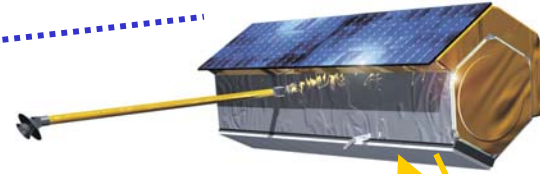
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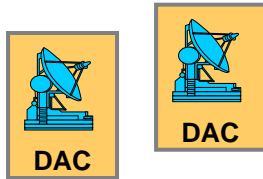


DNEPR-1



Cmd & Tlm

Data



DAC

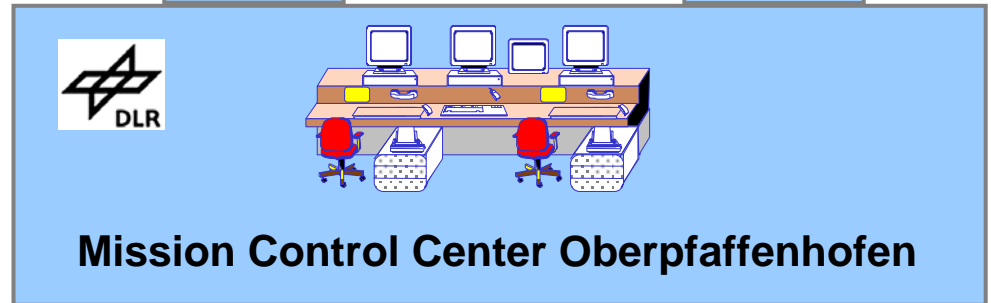
DAC



Groundstation
Neustrelitz



Groundstation
Weilheim



Mission Control Center Oberpfaffenhofen



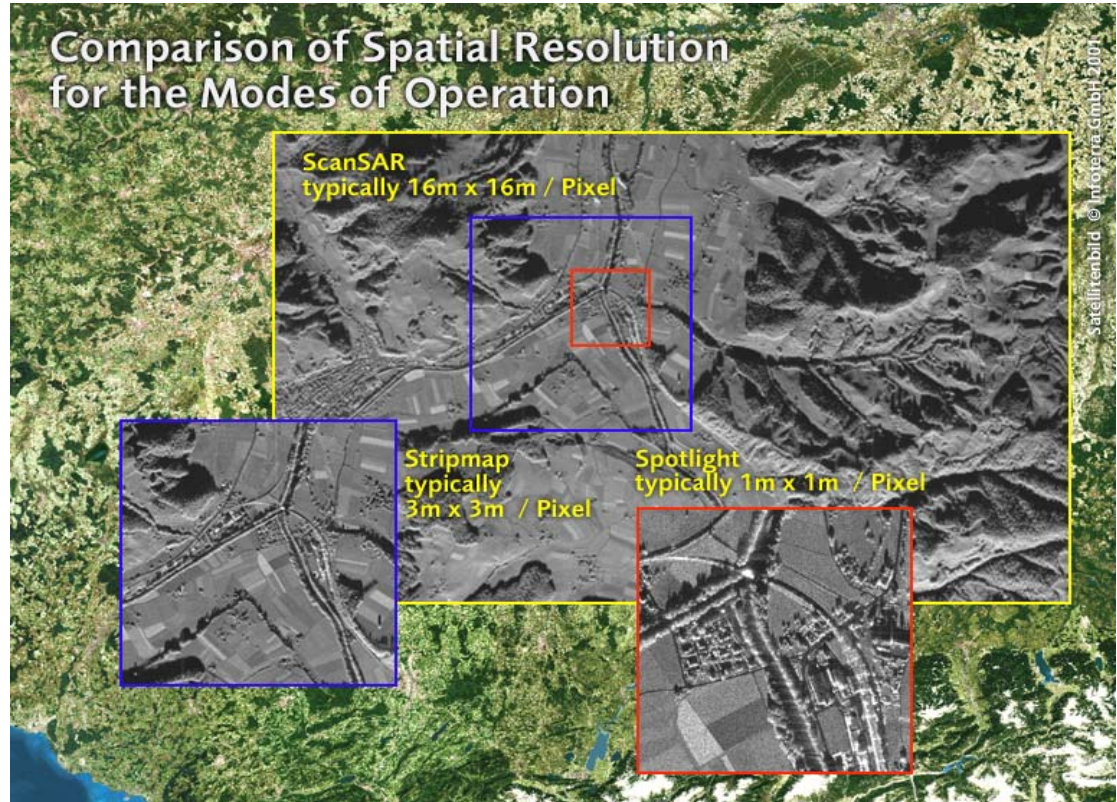
Imaging Modes

- Stripmap Mode
 - 30 km swath width
 - 3 m resolution

- ScanSAR Mode
 - 100 km swath width
 - 16 m resolution

- Spotlight Mode
 - 5 km x 10 km scene
 - 1 m resolution

Comparison of Spatial Resolution for the Modes of Operation

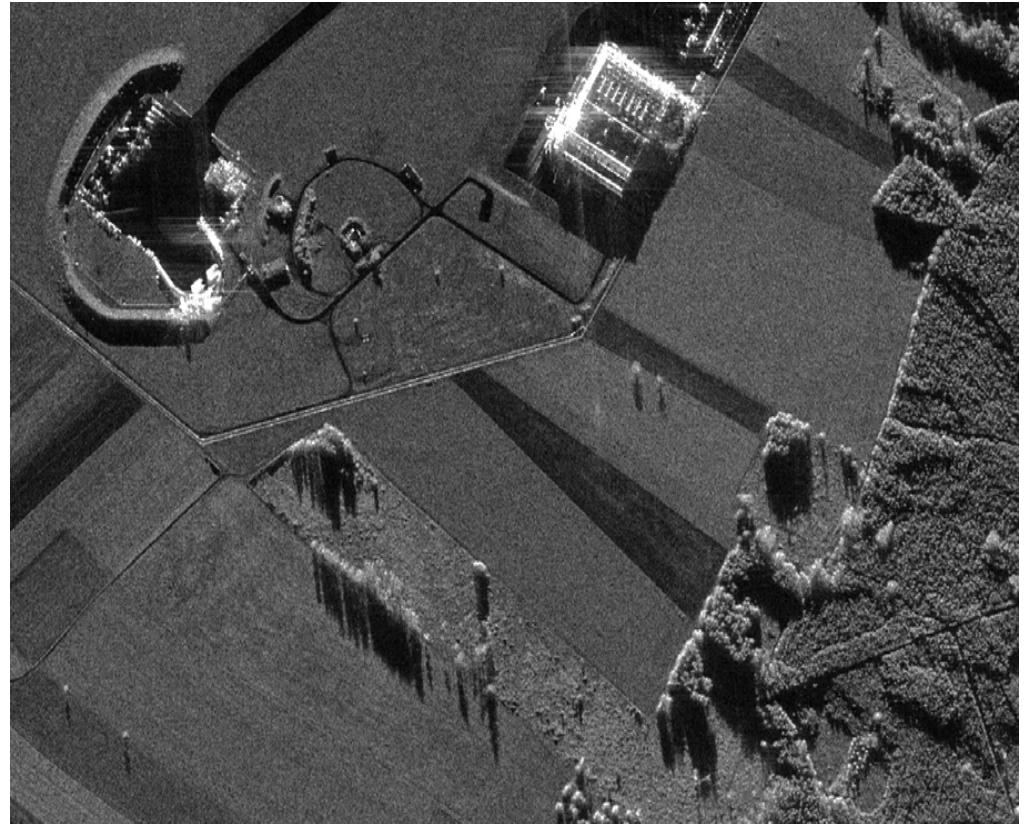


- Dual Receive Antenna Mode
 - Along-Track Interferometry, Moving Target Identification

Simulated TerraSAR-X Image



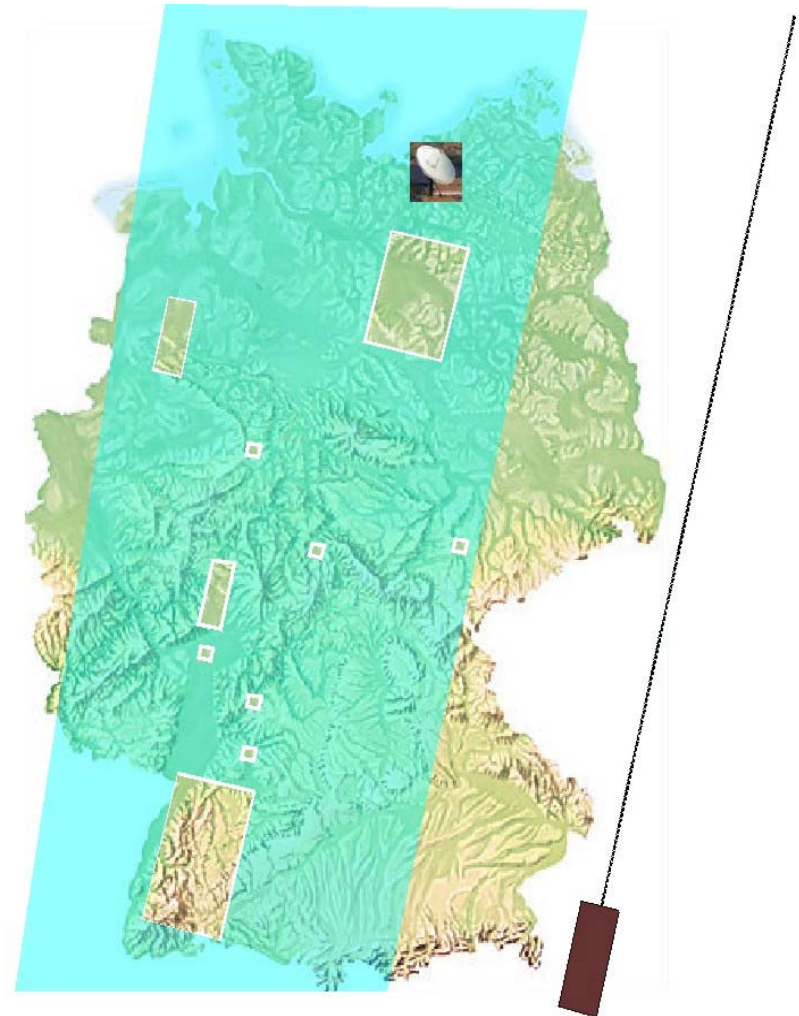
Testsite Oberpfaffenhofen (1,5 m resolution)



TerraSAR-X: high operational flexibility



- Very fast change between different imaging modes and target areas
- Very high resolution in SpotLight mode
- Possibility of large area coverage by utilizing ScanSAR mode
- Simultaneous imaging and data downlink possible
- Secure operation by encryption of commands and data downlink



Data availability

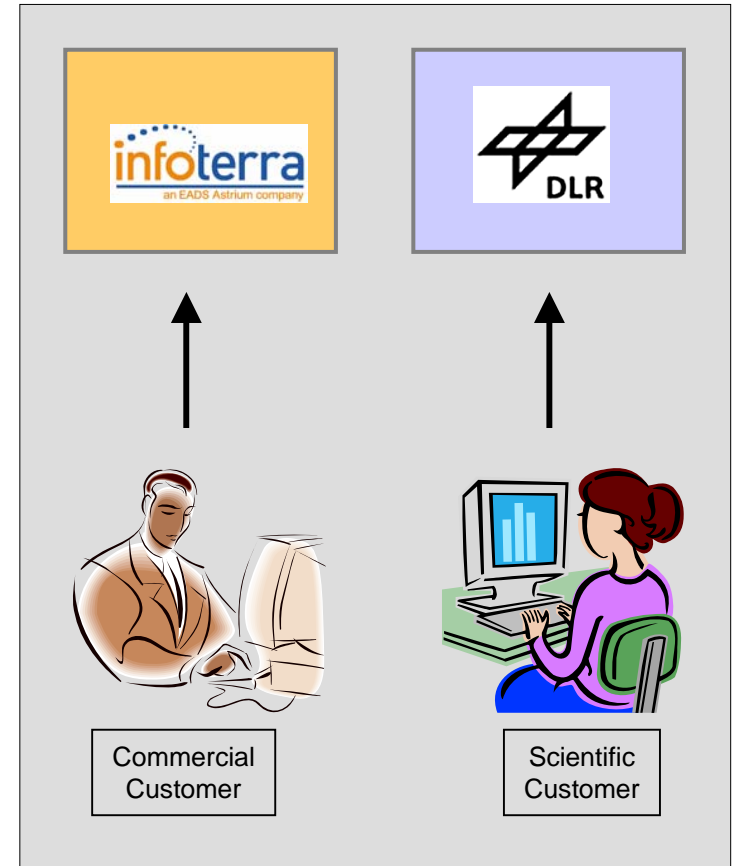


Scientific Data:

- DLR is in charge of coordinating the scientific use of the TerraSAR-X data
- Data will be generally provided via a Announcement of Opportunity (AO)
- A pre-launch AO has already been released
- DLR will ensure the an independant and fair review of the proposals
- Data will be provide for COFUR-cost (cost of fullfilling the user request)
- License agreement is required

Commercial data:

- Commercial Customers will receive data via Infoterra GmbH
- Market price will be determined by Infoterra GmbH

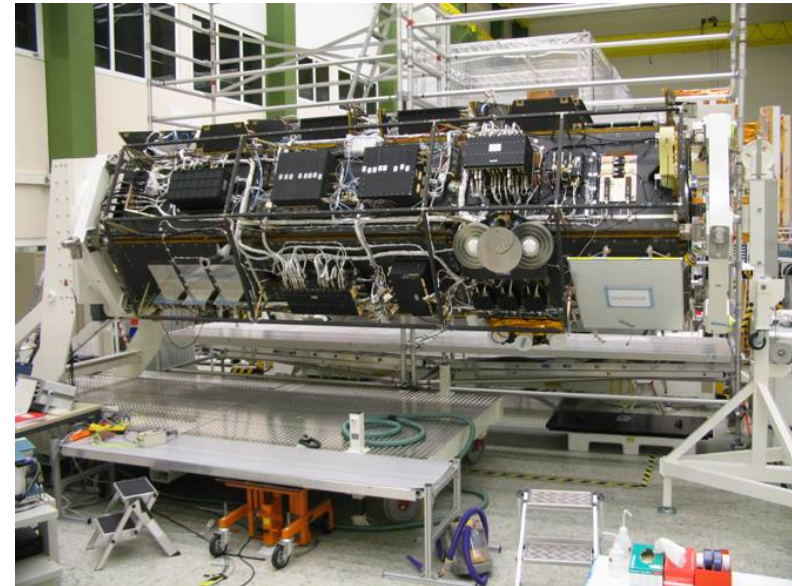


http://www.eid.dlr.de/tsx/start_en.htm

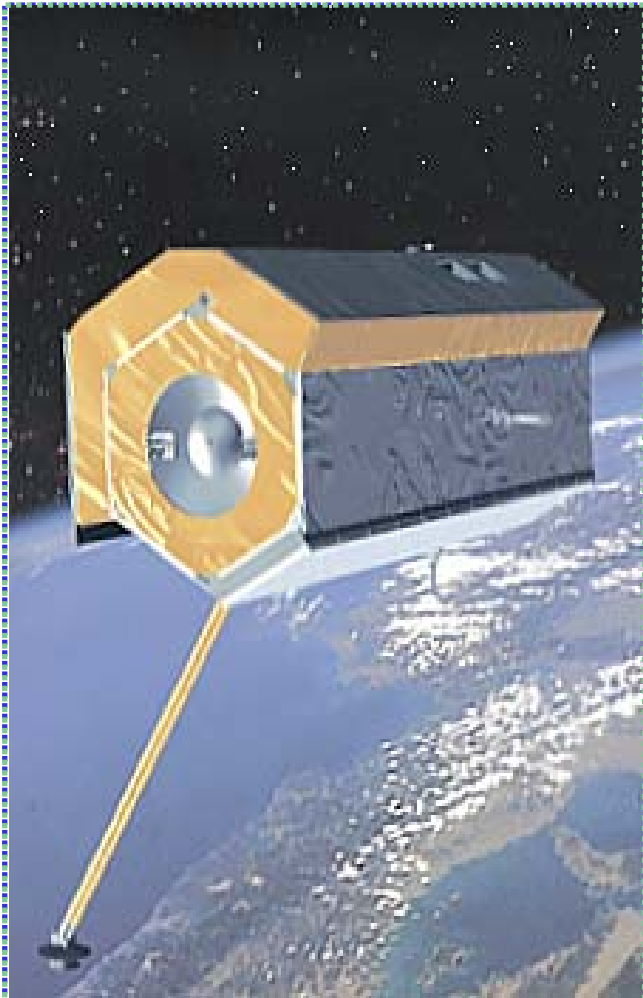
Project Status



- TerraSAR-X project has been initiated in 2001
- Satellite integration will be completed by April 2006
- Launch is scheduled for summer 2006
- 5 months Commissioning Phase after launch
 - Check-out of satellite bus
 - Check-out of SAR-instrument
 - Calibration activities
- First product available in December 2006
- Fully operational by April 2007

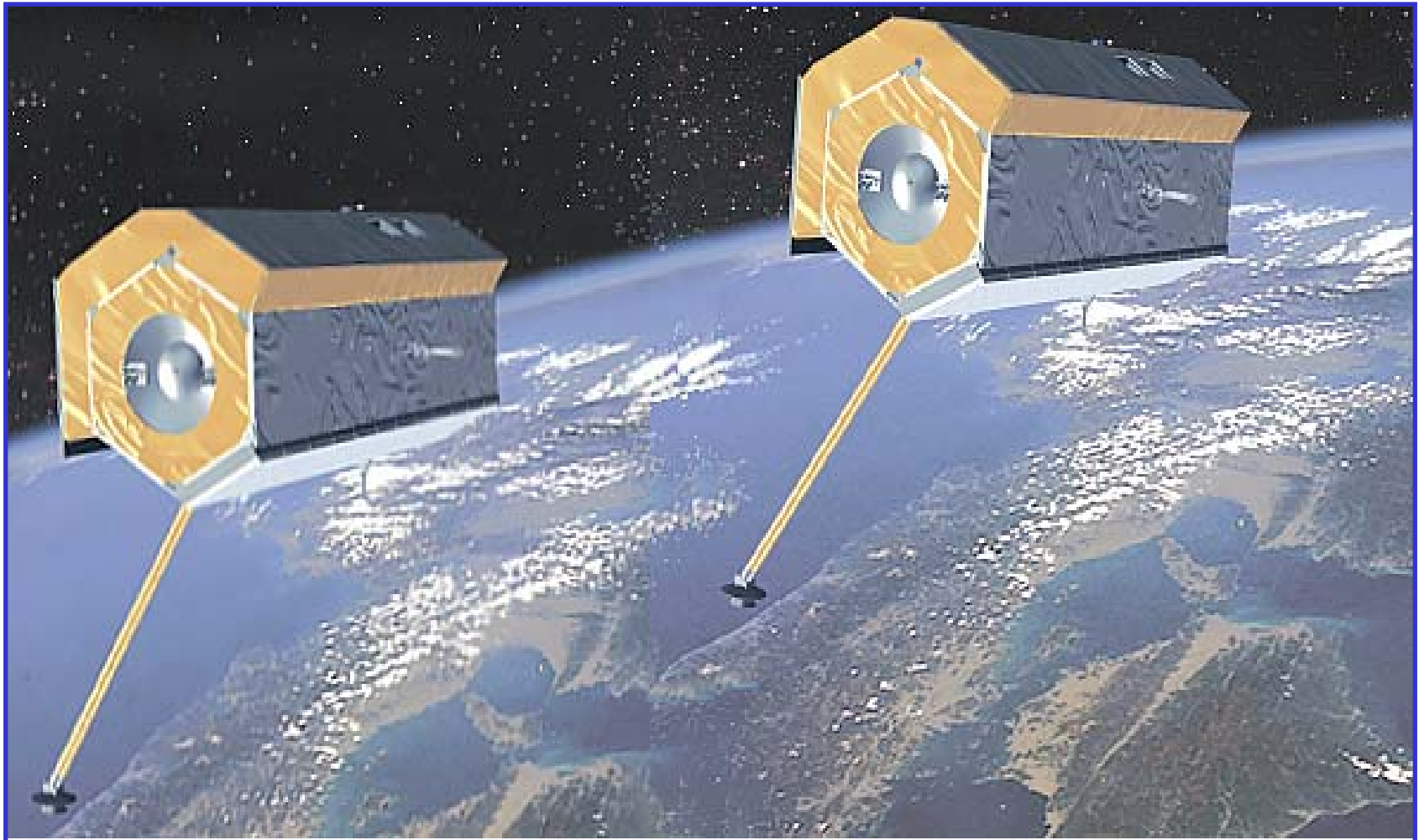


TerraSAR-X Vision



- The only thing more useful than TerraSAR-X ...

TanDEM-X proposal



- **The only thing more useful than TerraSAR-X ... is two of them.**

TanDEM-X

- TanDEM-X main mission objective is to generate a high precision, global Digital Elevation Model (DEM)
- TanDEM-X is a national SAR interferometry mission employing
 - the TanDEM-X satellite as a rebuild of TerraSAR-X
 - TSX-1 to form the tandem constellation
- Proposed launch early 2009
- TanDEM-X Public Private Partnership (PPP) model amending the TerraSAR-X PPP scheme

