

TanDEM-X Status

Dieter Hausamann, DLR

WGCapD-3 Annual Meeting
Dehradun, 24 April, 2014



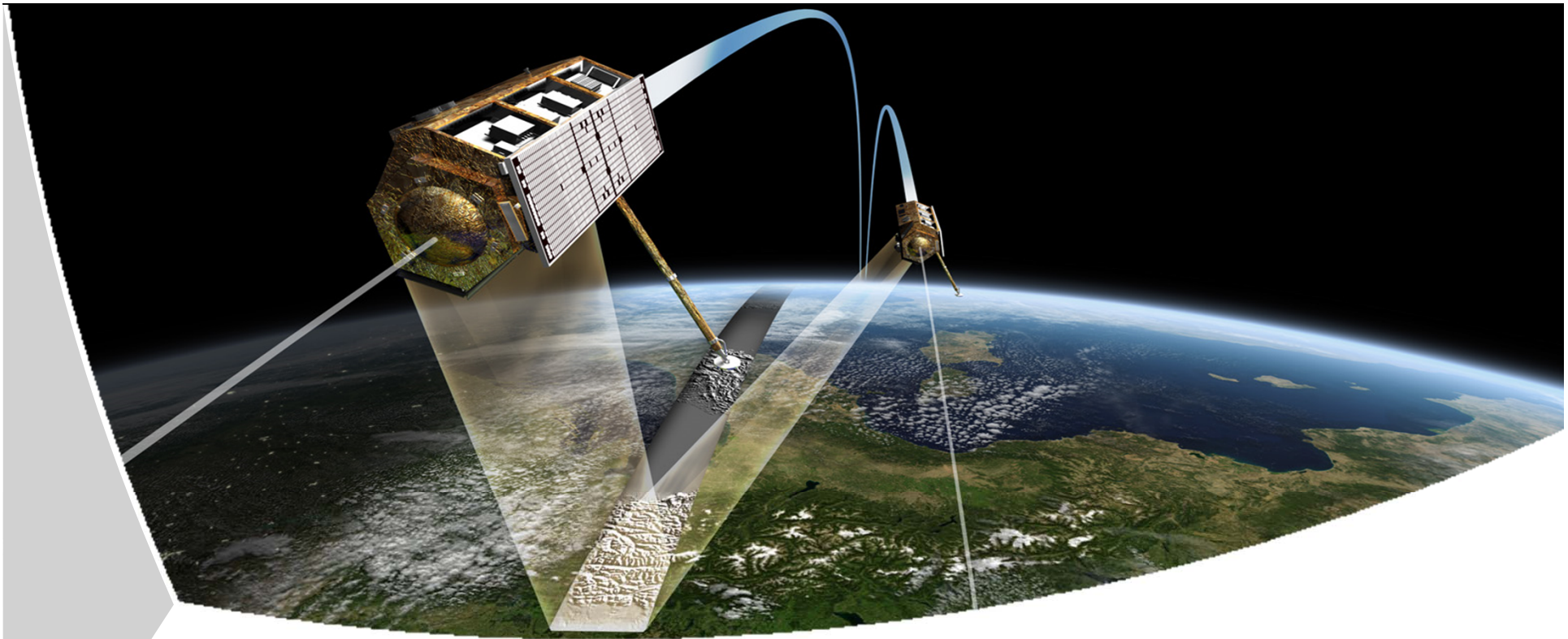
TanDEM-X: new generation global digital elevation data

Jörn Hoffmann
German Aerospace Center (DLR)

GEO-X Meeting

Geneva, January 15, 2014





The Radar Satellite Missions TerraSAR-X & TanDEM-X

Manfred Zink
DLR Microwaves and Radar Institute

27 - Januar - 2014

DLR - Locations and employees

7,700 employees across
32 institutes and facilities at
■ 16 sites.

Offices in Brussels, Paris,
Tokyo and Washington.

Oberpfaffenhofen:
Microwaves and Radar Institut

Bonn:
Space Agency



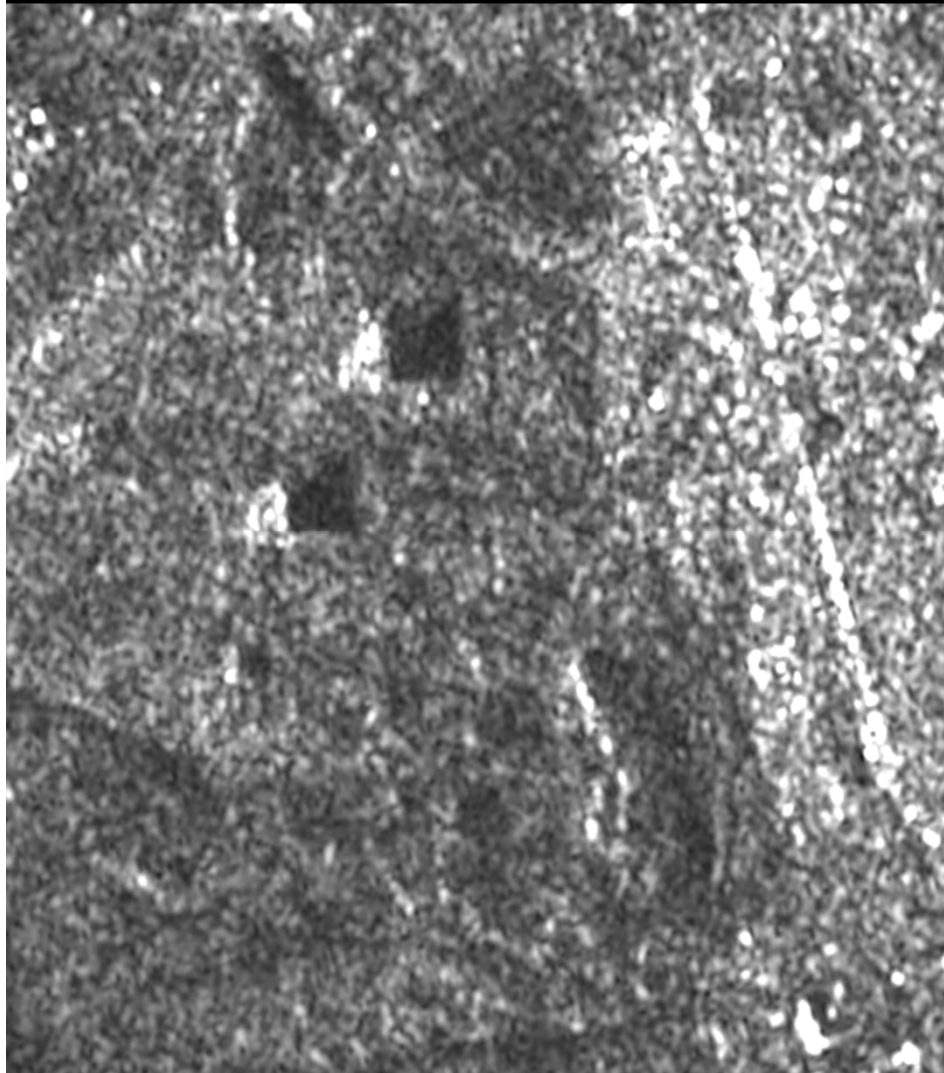


Global DEM (HRTI-3)

Local DEM (HRTI-4)

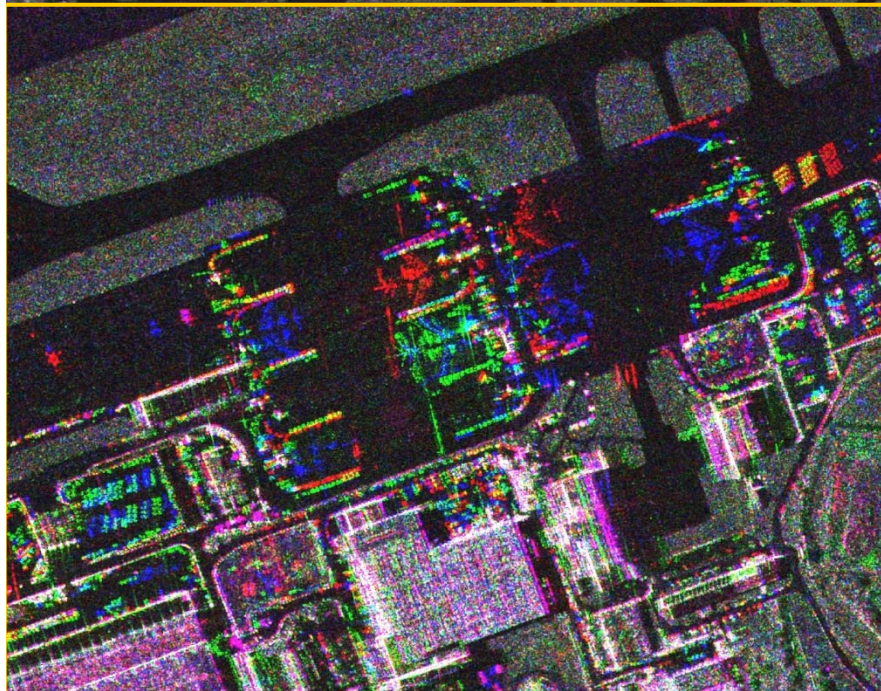
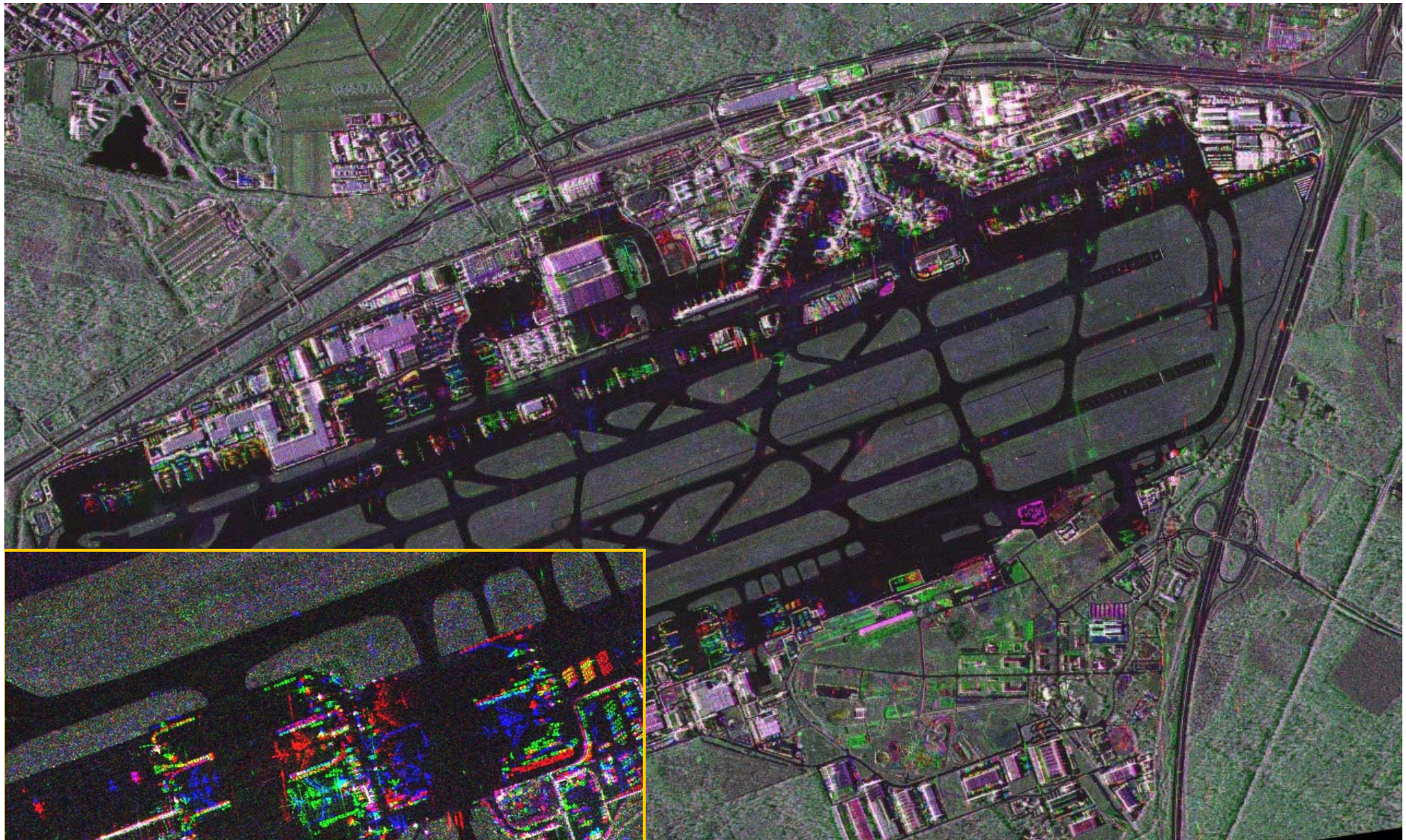
**Scientific bistatic
imaging applications**

Previous Civilian SAR Sensors
20 m Resolution



TerraSAR-X
1 m Resolution





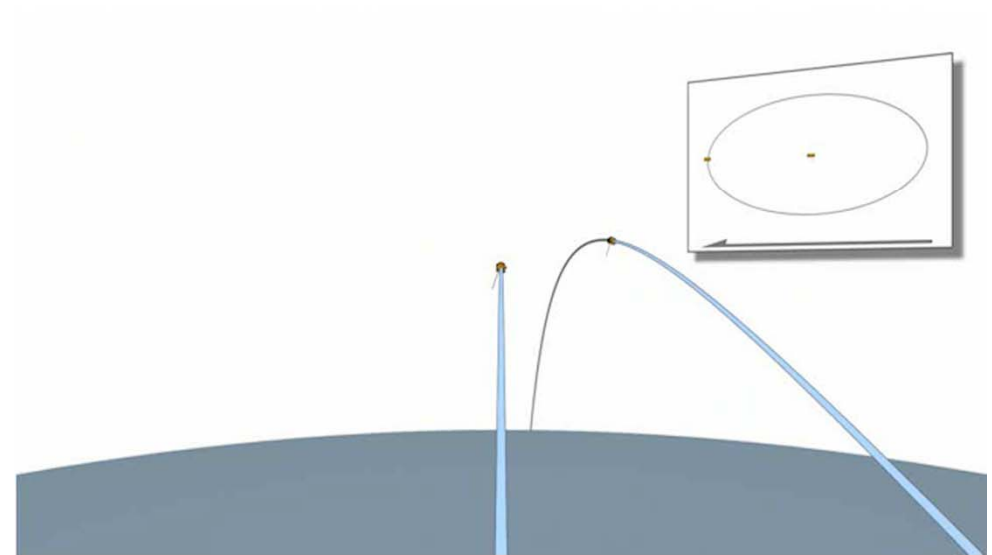
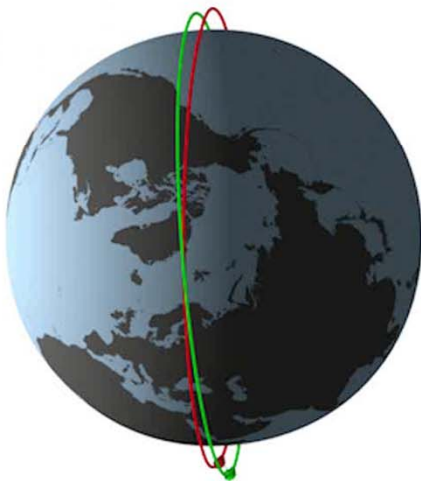
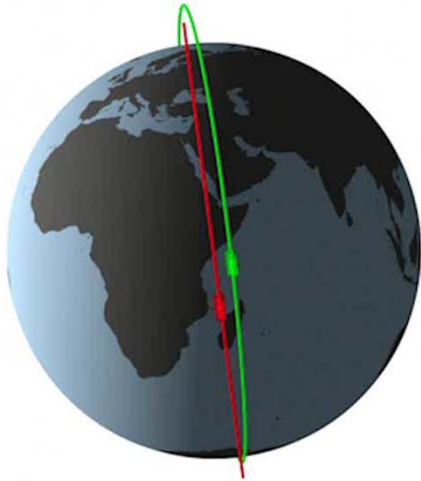
**Multi-temporal Image
Frankfurt Airport**

Desaster Monitoring Sendai Area, Japan 20-Okt-2010 & 12-Mar-2011

TerraSAR-X Change Analysis of Sendai Area, Japan

1:75.000

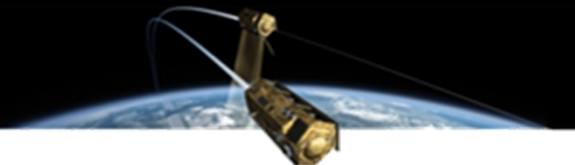






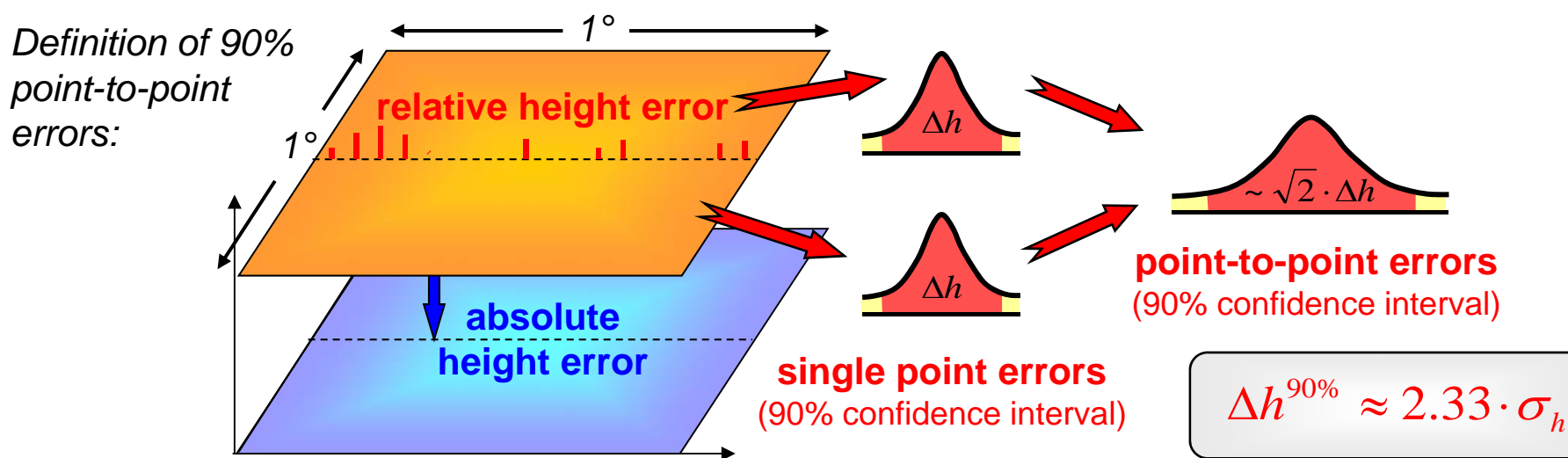
Product Specifications (standard product)

- **Globally consistent DEM**
- **12m posting**
- **Absolute elevation error $\leq 10\text{m}$**
- **Relative elevation error $\leq 2\text{m}$**
- **Meets HRTI-3 standard**

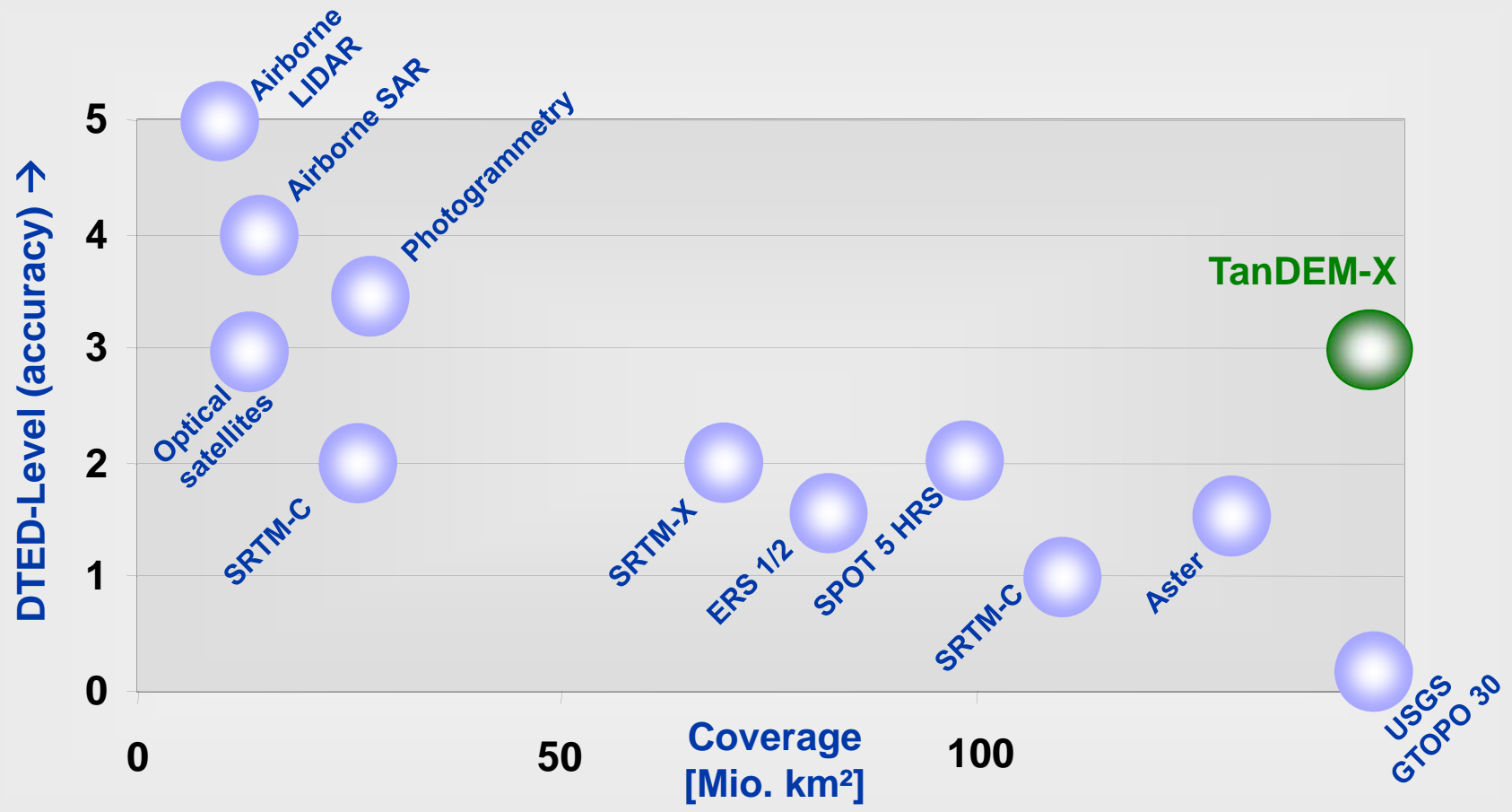


Standards for Digital Elevation Models

	Spatial Resolution	Absolute Vertical Accuracy (90%)	Relative Vertical Accuracy (point-to-point in 1° cell, 90%)
DTED-1	90 m x 90 m	< 30 m	< 20 m
DTED-2	30 m x 30 m	< 18 m	< 12 m
TanDEM-X	12 m x 12 m	< 10 m	< 2 m
Level-4	6 m x 6 m	< 5 m	< 0.8 m

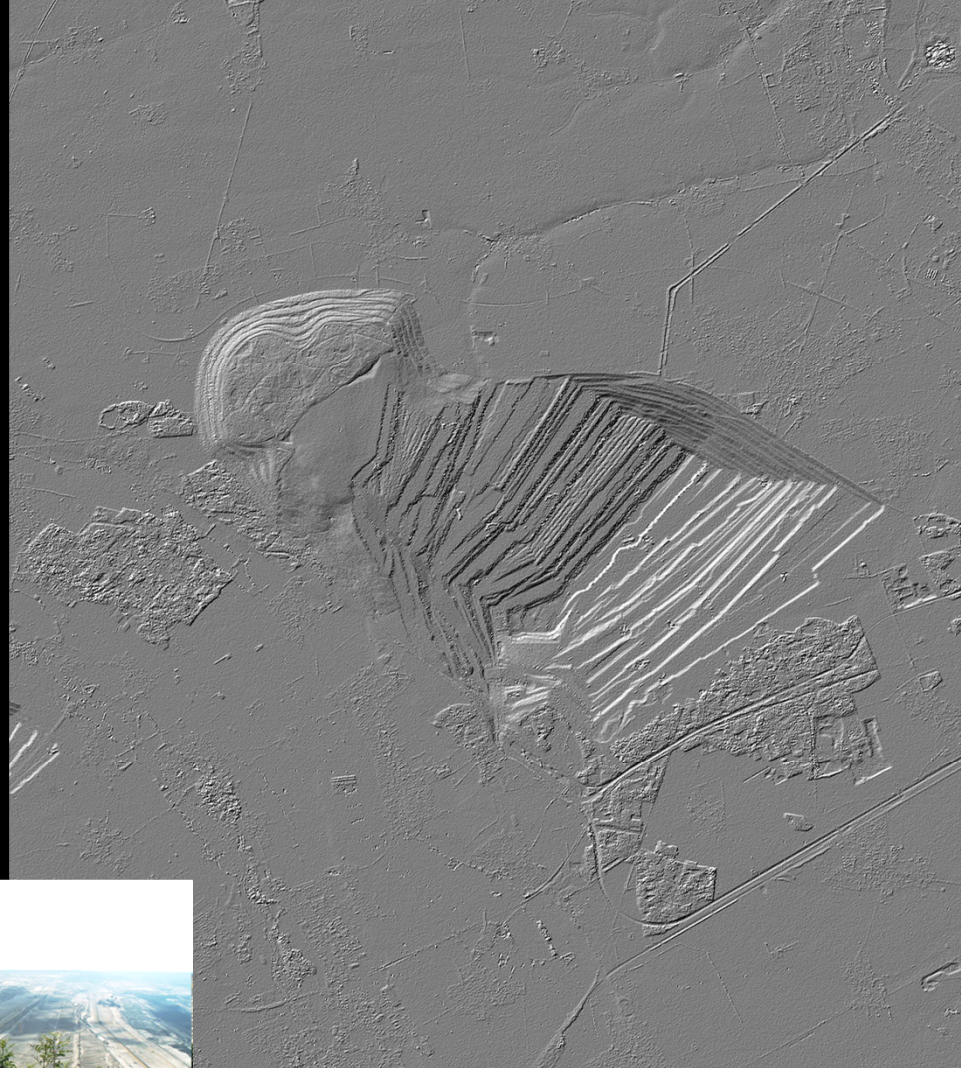
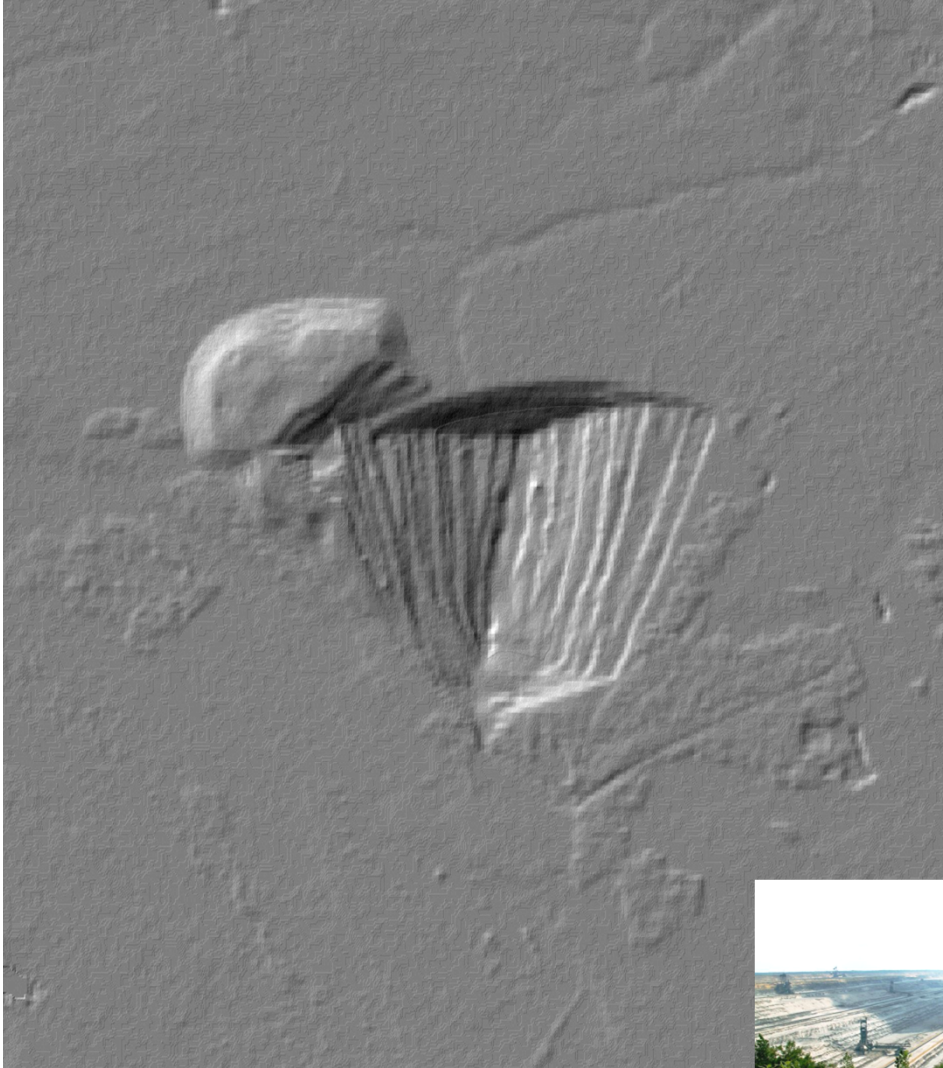


Comparison with other digital elevation models



SRTM

TanDEM-X

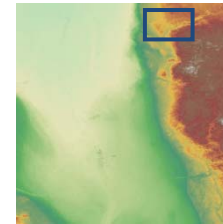
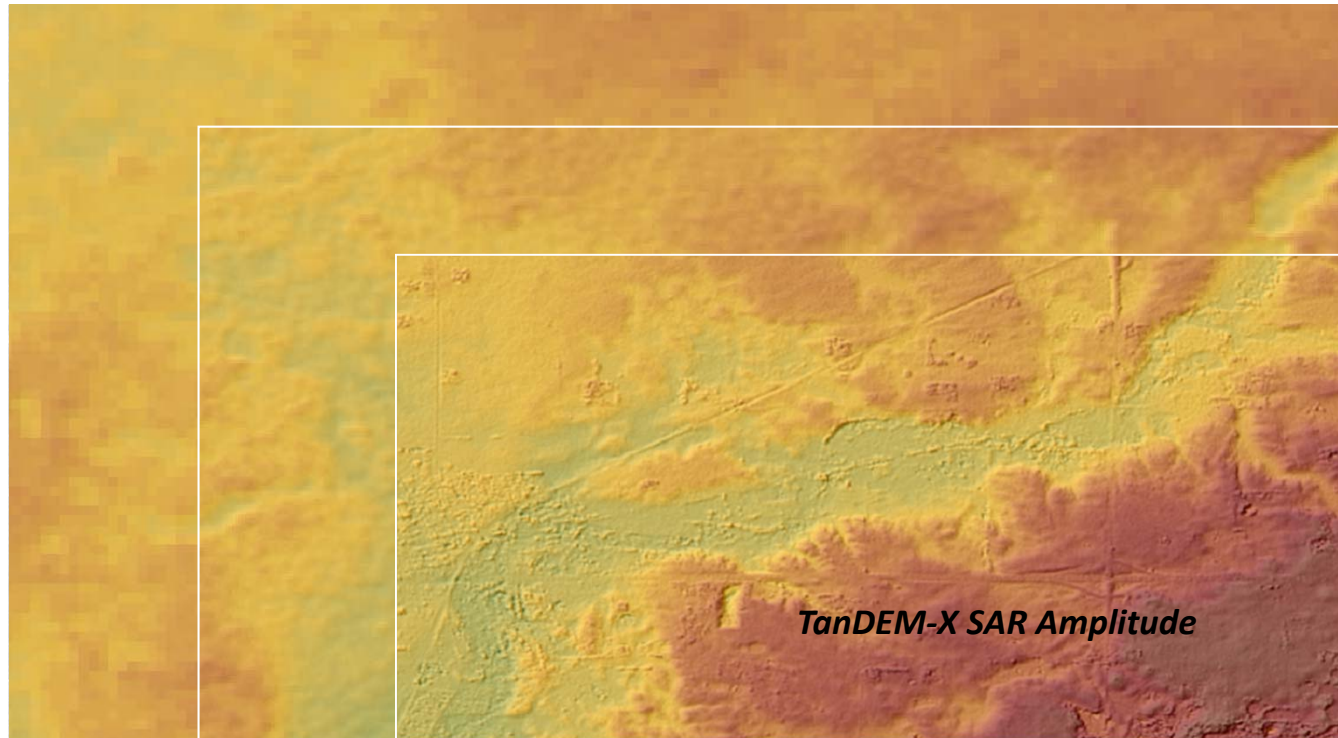


Kohletagebau Hambach

SRTM 3"

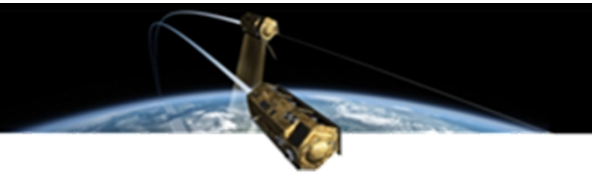
SRTM 1"

WorldDEM™ 0.4"

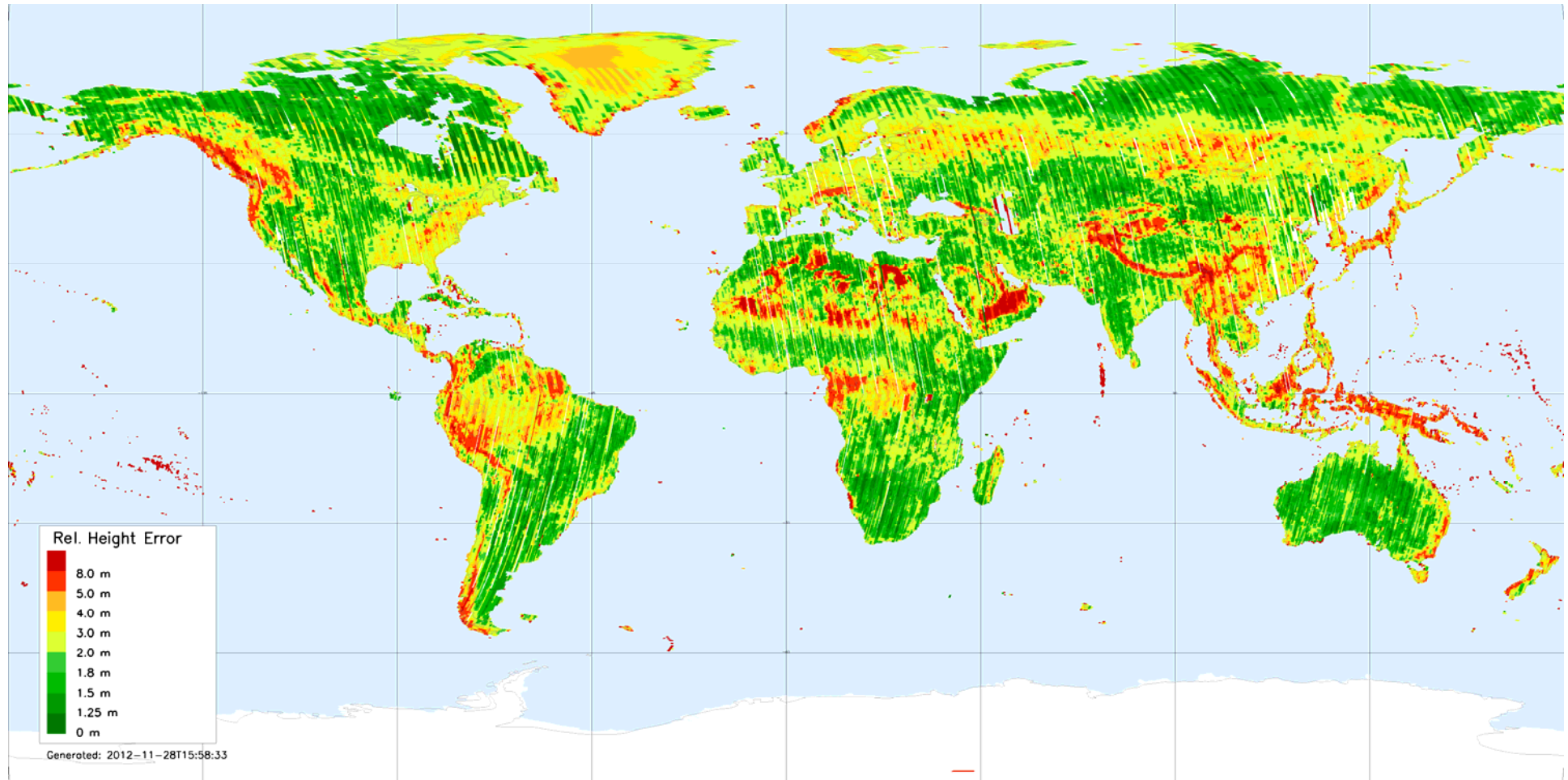


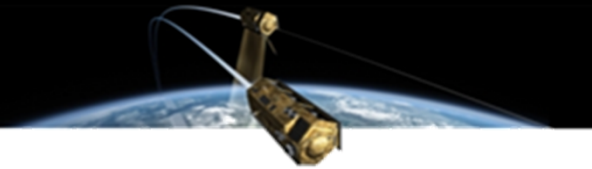
Close-Up



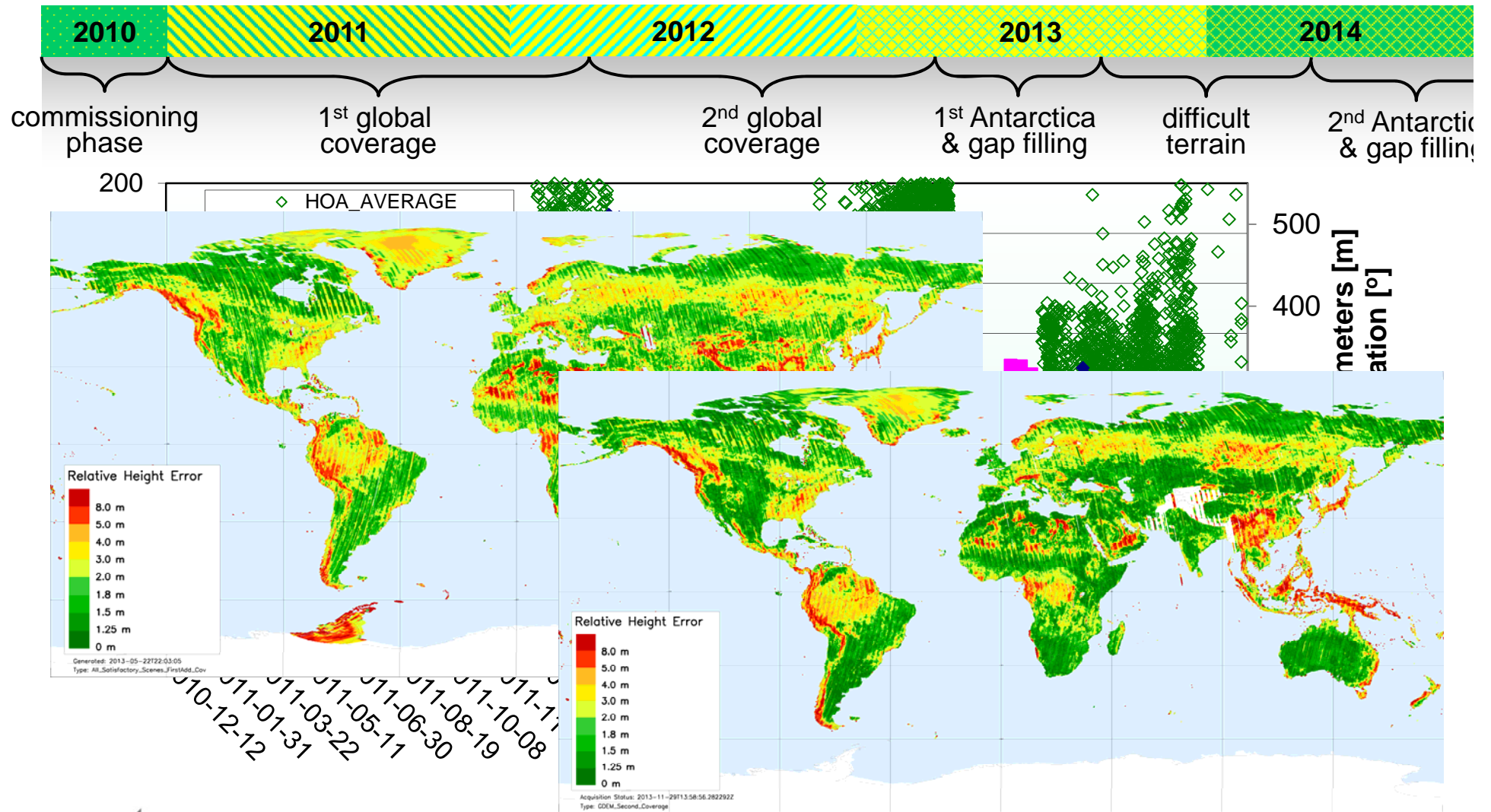


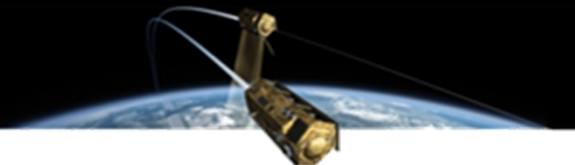
Relative Height Error of First Global Coverage



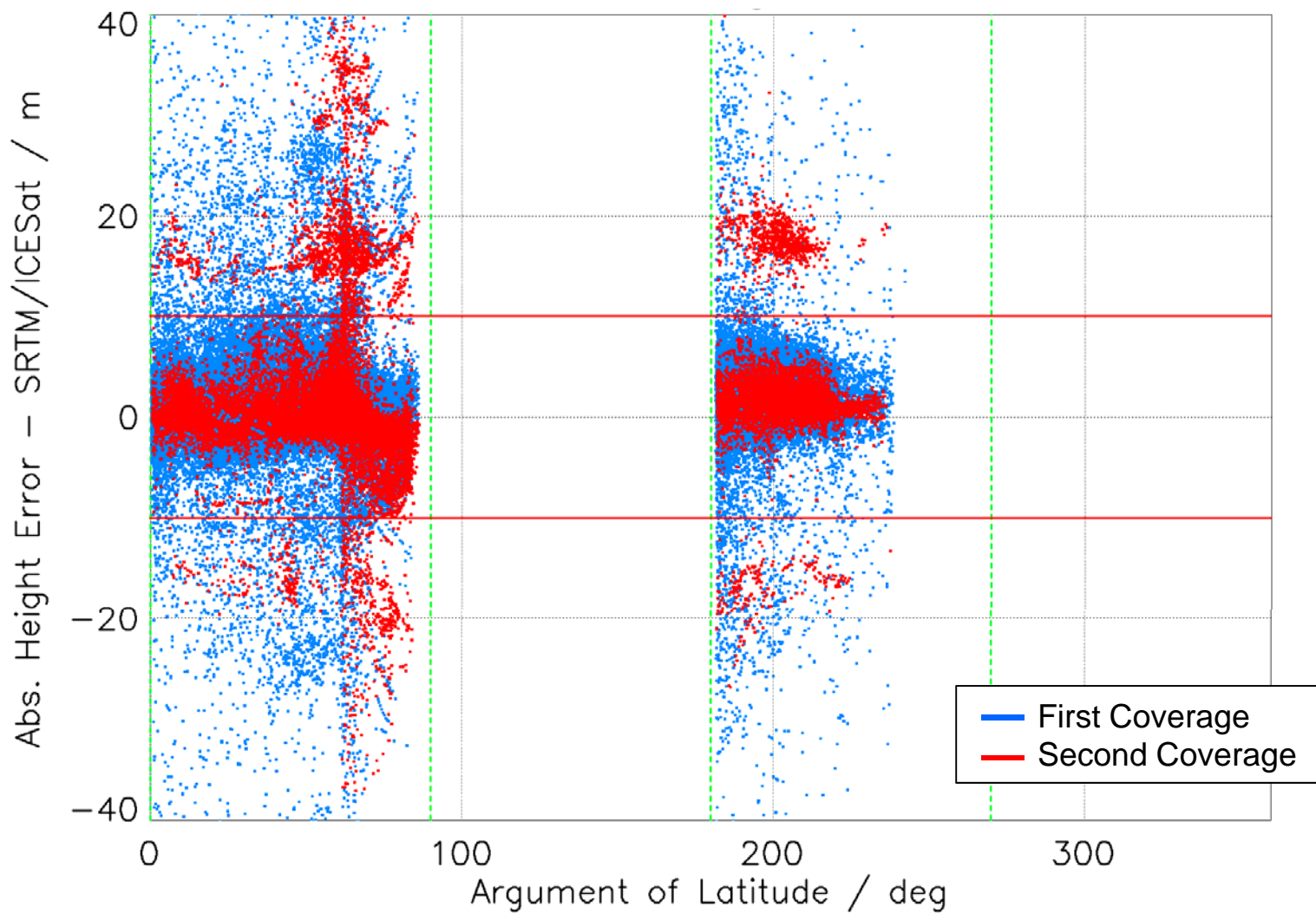


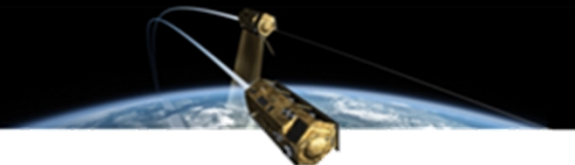
TanDEM-X Global DEM Acquisition Plan



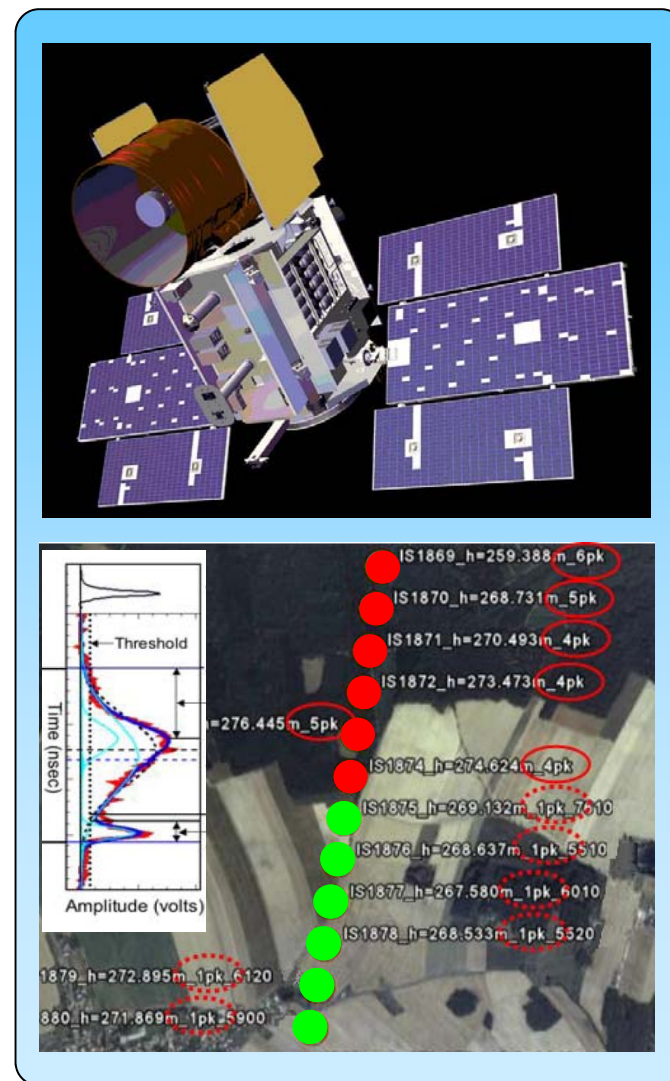
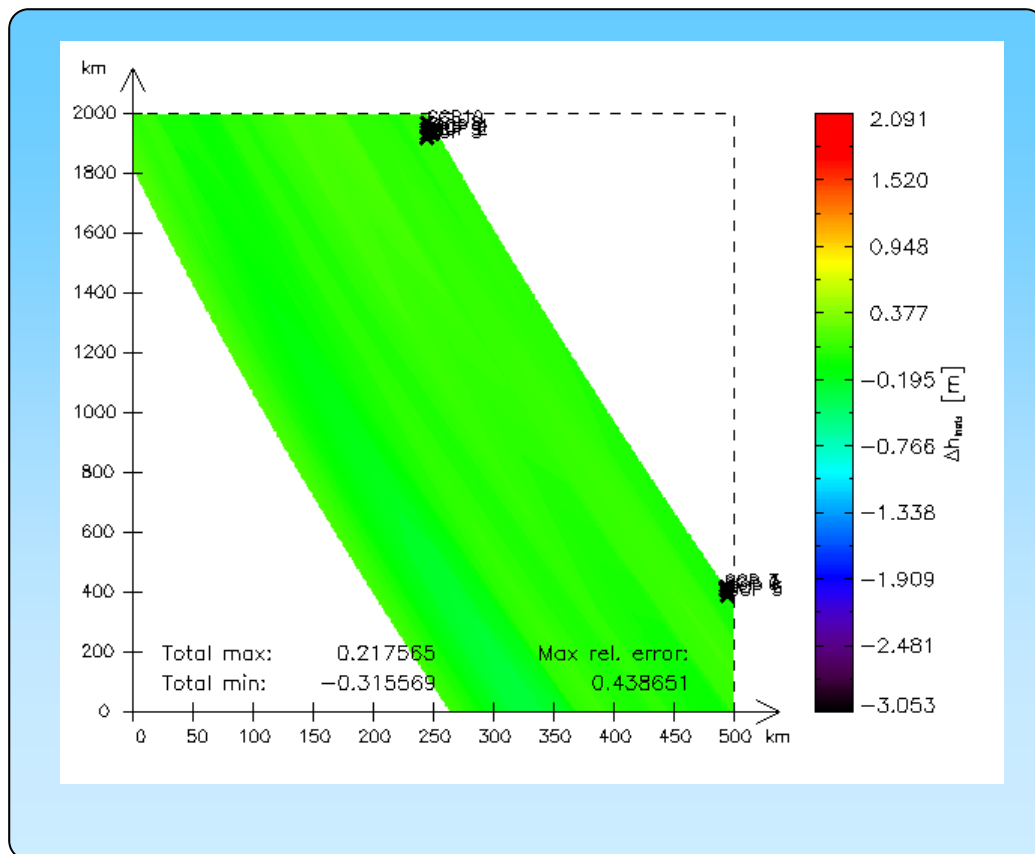


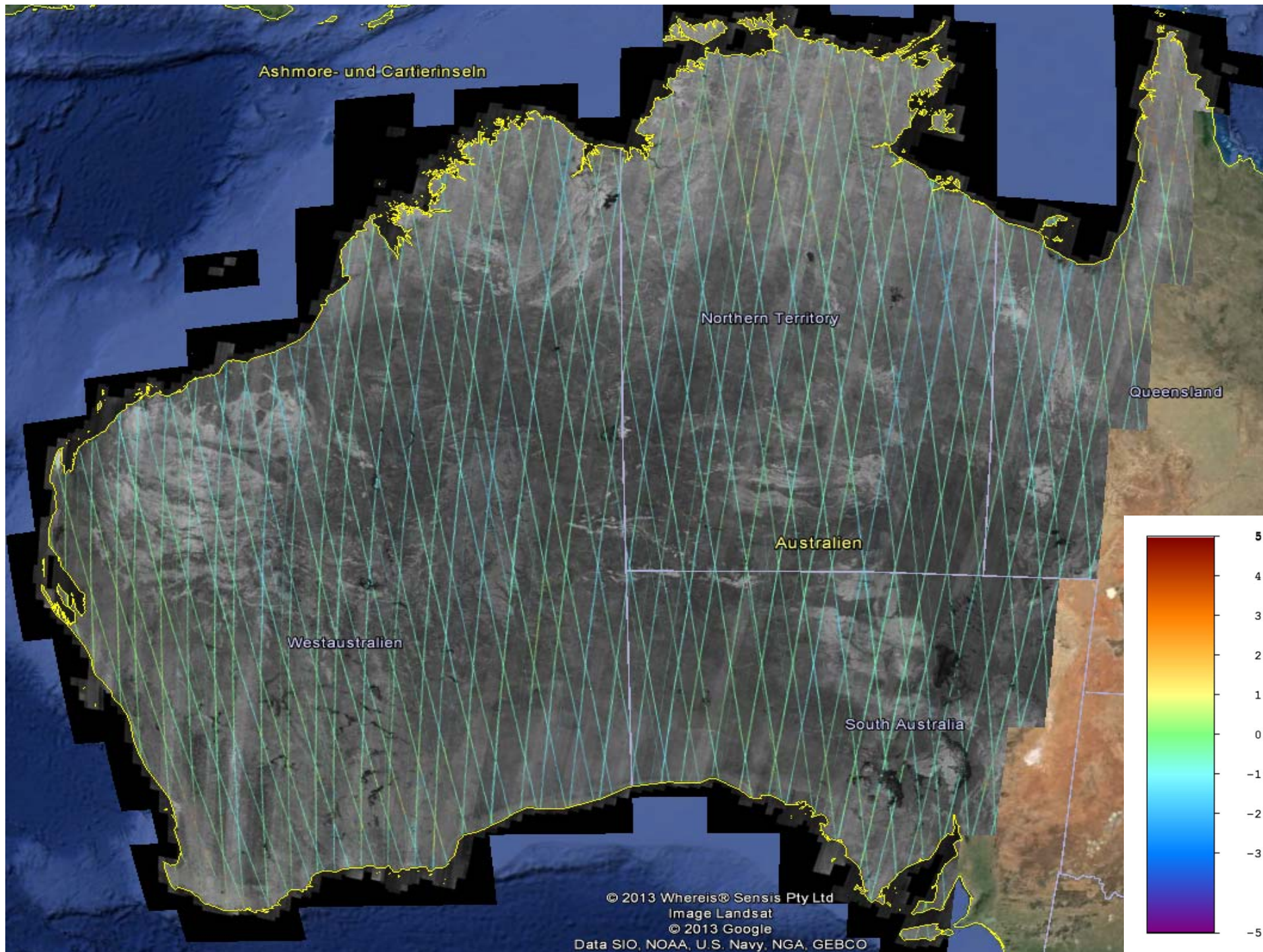
Absolute Height Error of Scene-Based RawDEMs

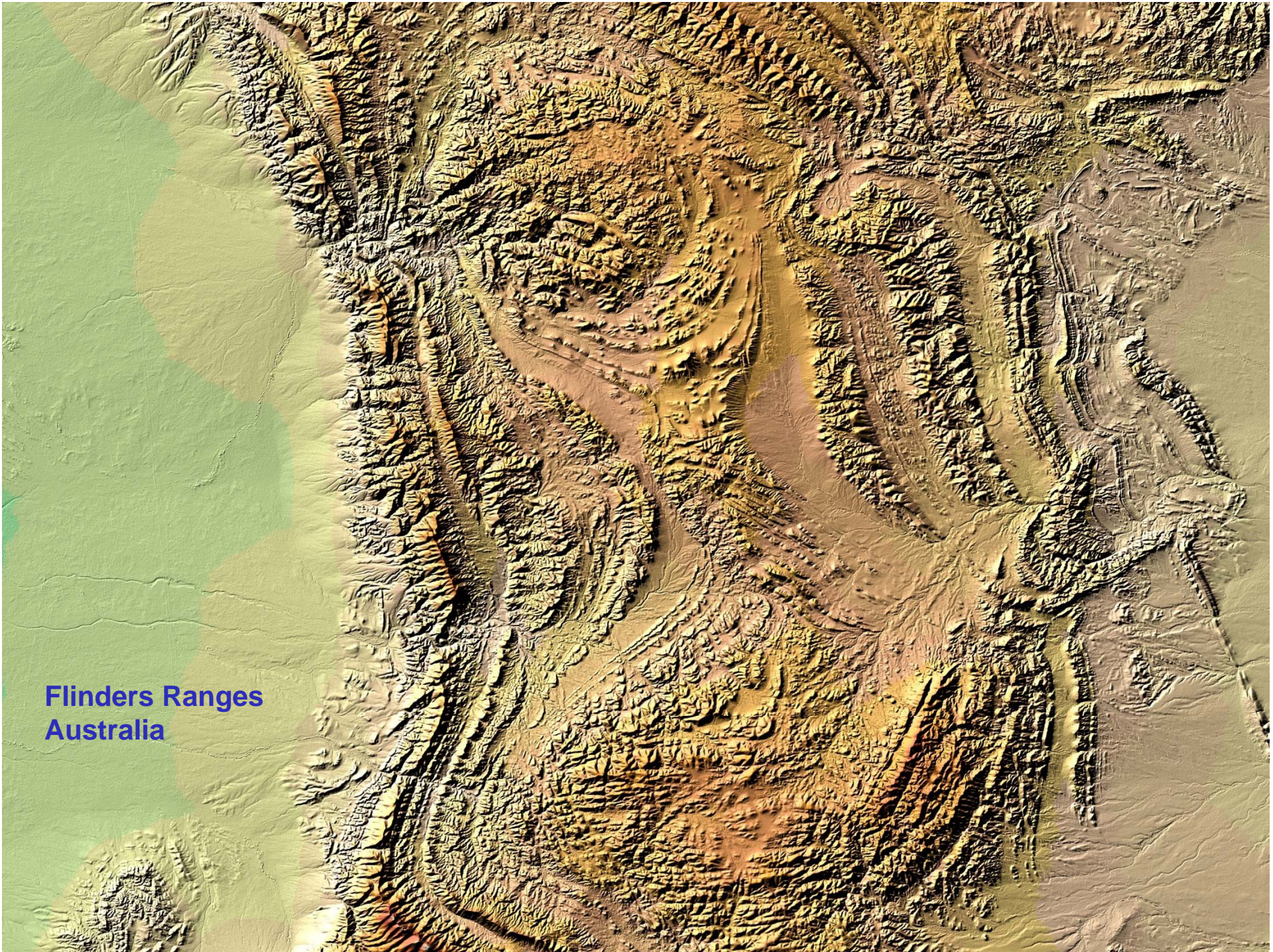




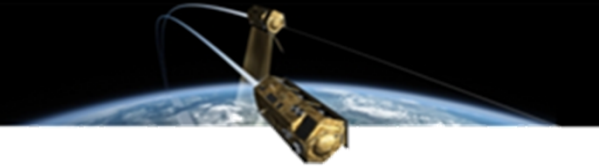
Final DEM Adjustment using ICESat Altimeter Data







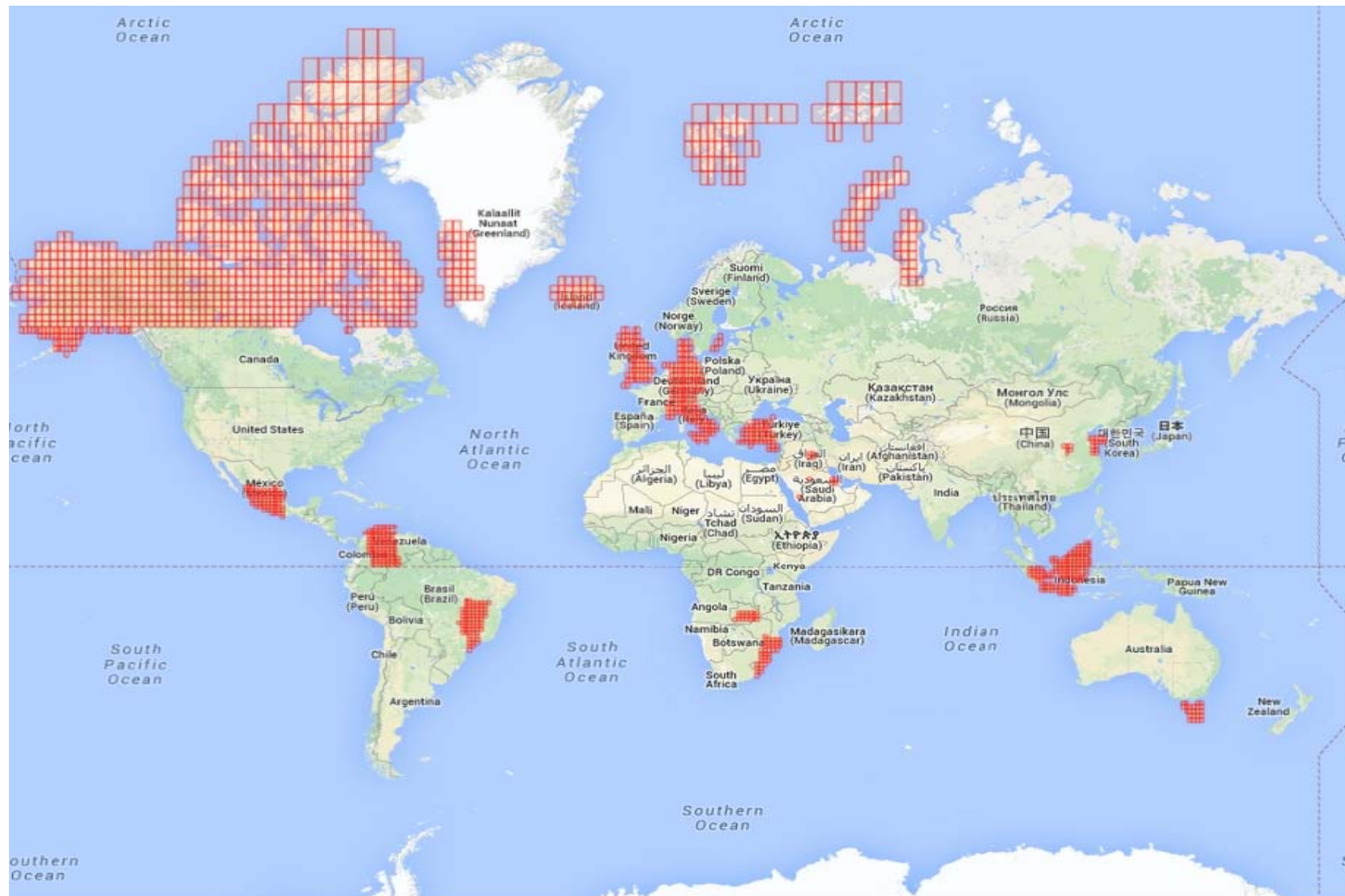
**Flinders Ranges
Australia**



TanDEM-X Mission Status

- Stable operations in close formation
- Both satellites and the ground segment perform remarkably well
- first & second global (& first Antarctica) acquisition completed, third & fourth coverage in progress
- data acquisition for the global DEM finished by the end of 2014
- Performance & calibration of the system well within specification
- Delivery of Global DEM commenced in January 2014

Availability of Intermediate DEM (IDEM)



Secondary Mission Objectives

Bistatic SAR Imaging

Polarimetric SAR Interferometry

Along-Track Interferometry

Ground Moving Target Indication

Double Differential Interferometry

Digital Beamforming

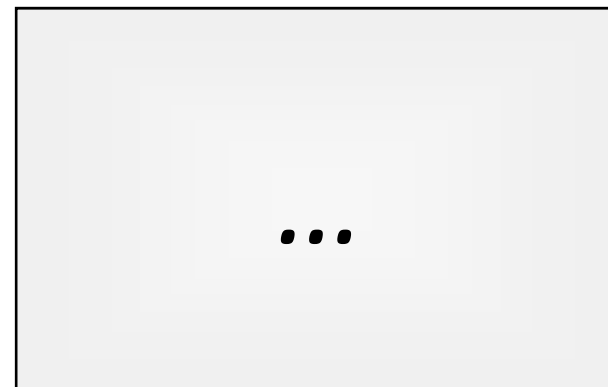
Enables High Resolution Wide Swath Imaging

Super Resolution

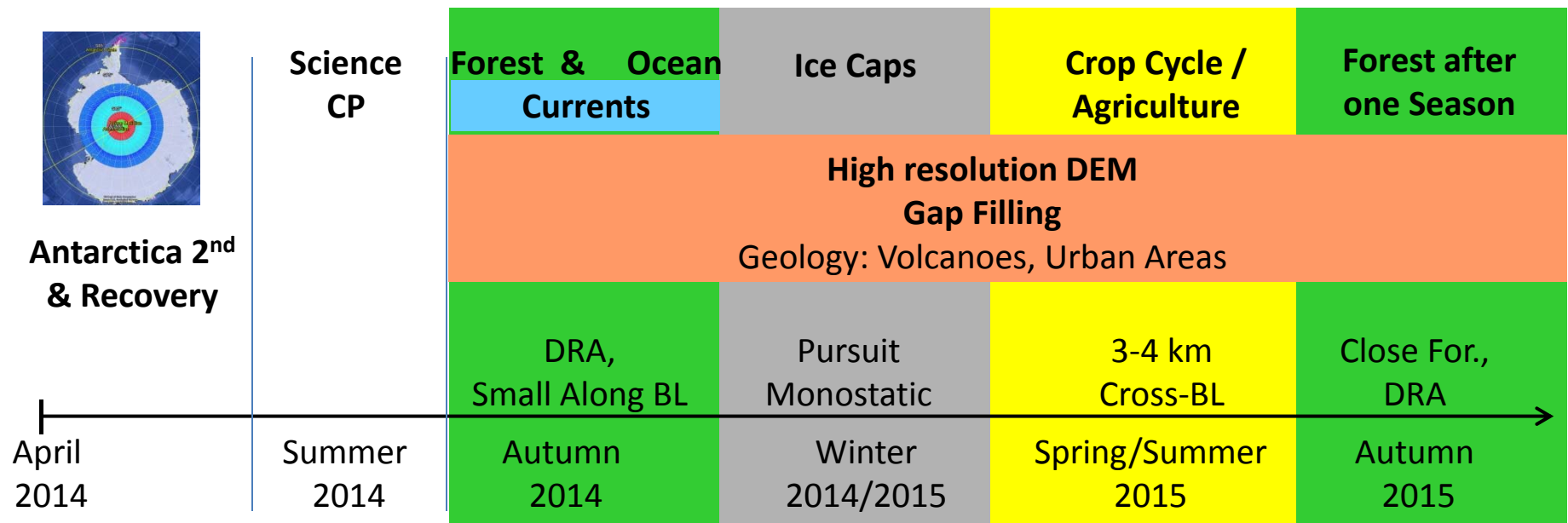
SAR Tomography

Airborne Polarimetric SAR Tomography

Upper image: Polarimetric color composite (L-band) of a tomographic slice in the height/azimuth-direction
 Lower image: Schematic view of the imaged area



TanDEM-X science phase 2014/2015





TanDEM-X Edu Project

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