

TerraSAR-X: Scientific Use

Achim Roth

Science Coordinator TerraSAR-X

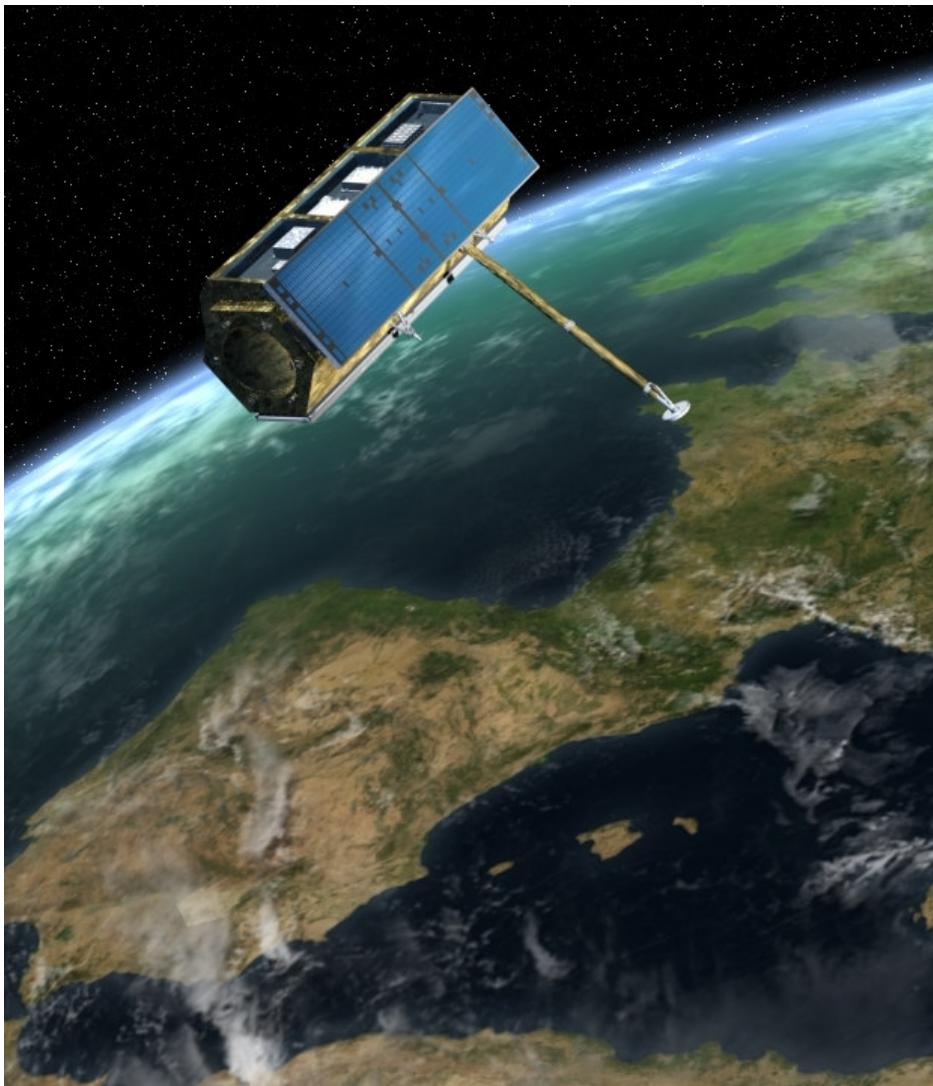
DLR – German Remote Sensing Data Center



Deutsches Zentrum
für Luft- und Raumfahrt e.V.
in der Helmholtz-Gemeinschaft



Introduction



- High-resolution radar mission
- National Implementation
- Scientific and commercial applications
- Public / private co-funding
 - ***Public Private Partnership (PPP)***
- Launch: June 15th, 2007
- Service started on January 7, 2008



“TerraSAR-X, a National Science Mission with Commercial Potential”

Public Private Partnership

DLR



- Project Management
- G/S Development & Ops
- Science Coordination
- System Engineering Support



EADS Astrium

- Platform Development
- Instrument Development
- Launch on Dnepr-1



Infoterra

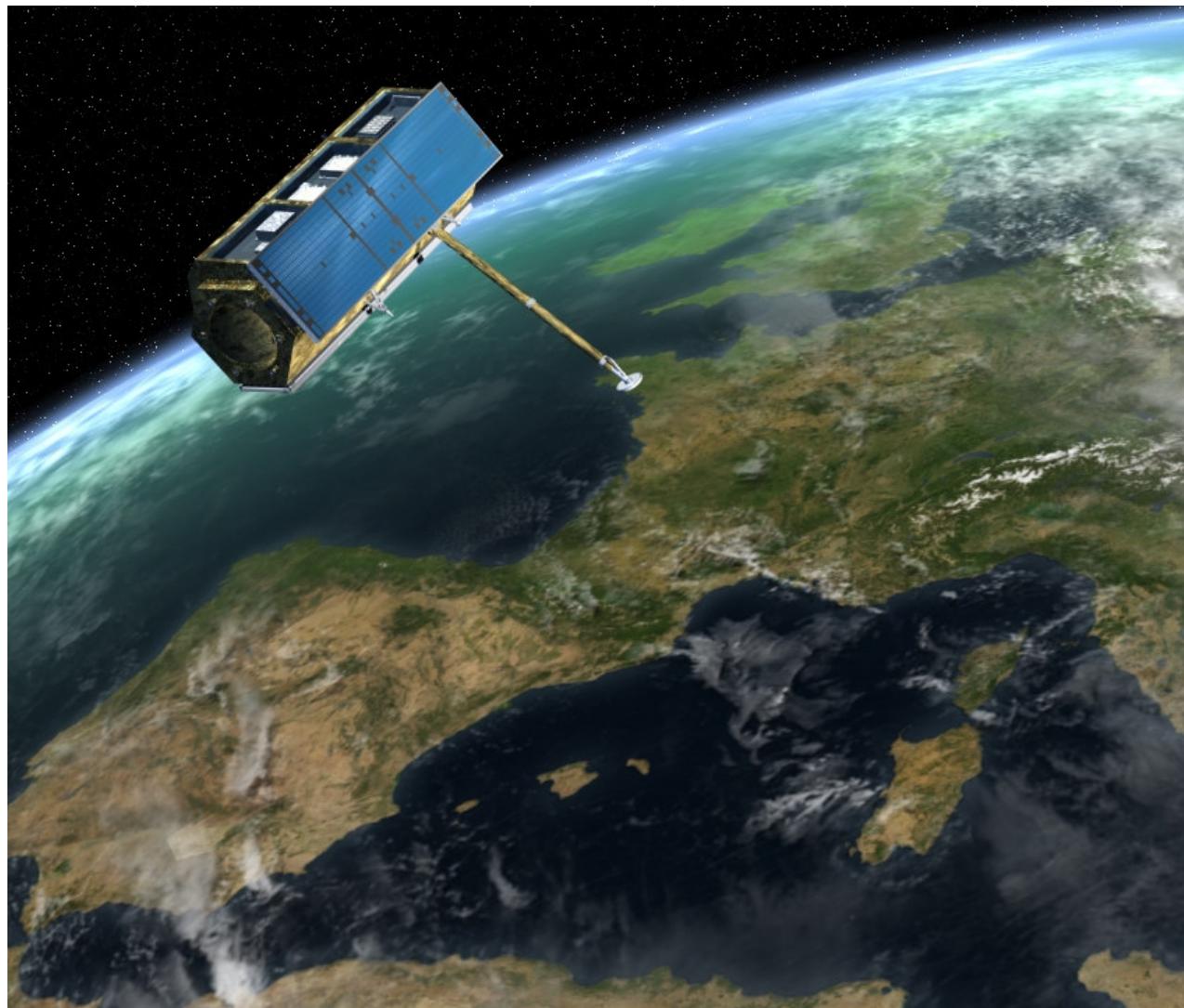
- Service Infrastructure
- Information Products
- Commercial Exploitation

Main Mission Goals:

- Provision of TerraSAR-X data and products for **scientific applications** → **public interest**
- **Commercial exploitation** of remote sensing data → **by industry**

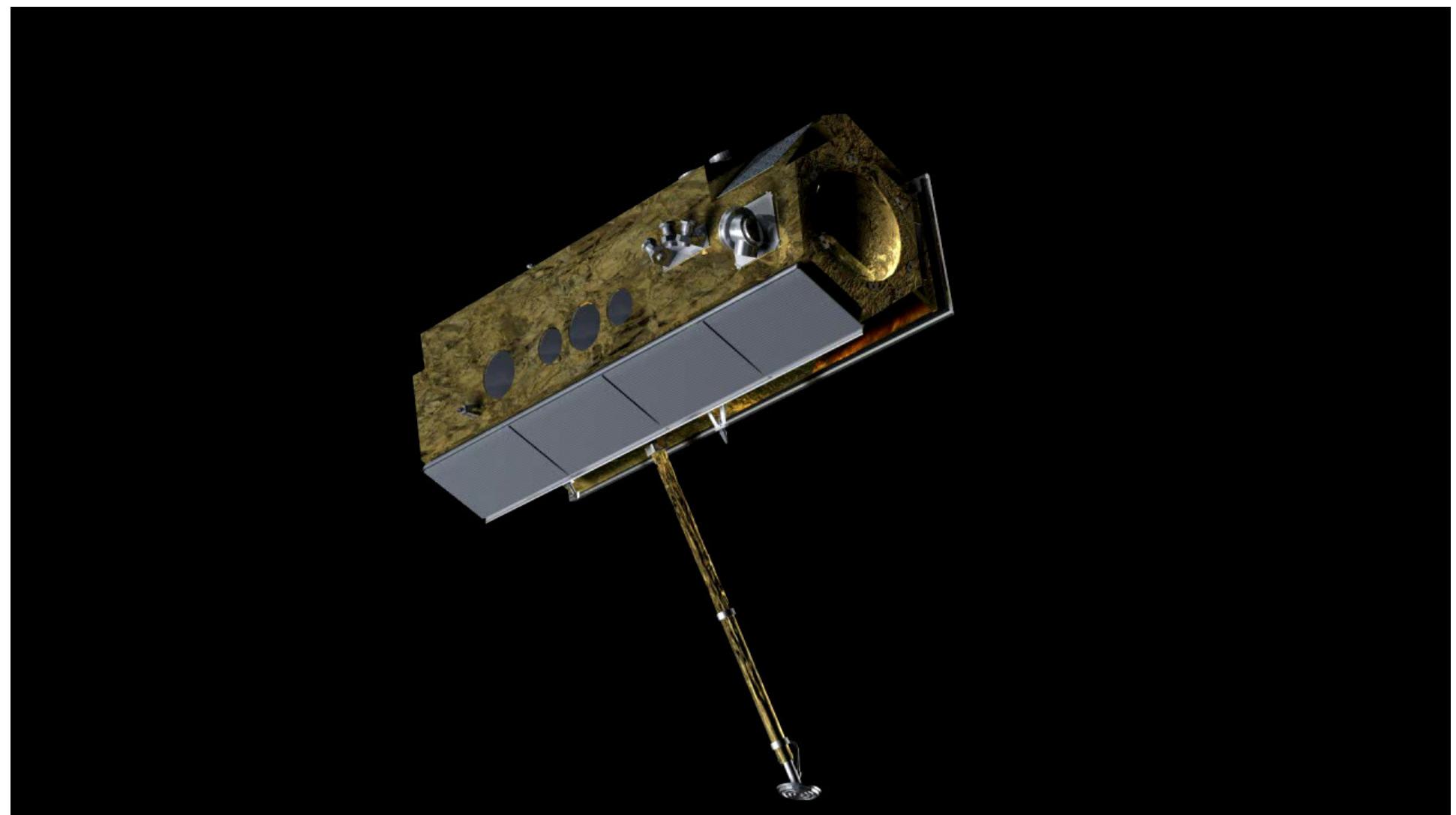


TerraSAR-X Satellite



- 514 km altitude
- 11 days repeat orbit
- Right looking, but rolling to left looking possible
- 256 Gbit memory (~350 secs StripMap data)
- Average load case:
110 secs in StripMap and
50 secs in Spotlight mode
- Peak load (x2)

- Transmit & receive in H or V polarization (single / dual)
- Experimental dual receive antenna mode



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TerraSAR-X Ground Segment – Mission Operations

The collage includes:

- An aerial view of the DLR Oberpfaffenhofen facility, showing several large buildings and green grounds.
- A landscape view of a rural area with fields and a small satellite dish antenna on a hill.
- A view of the International Space Station (ISS) in orbit around Earth.
- The interior of the Columbus Control Center, showing multiple monitors displaying data and a globe of the Earth.
- Two women working at computer stations in a mission control room, monitoring multiple screens.

*DLR Mission
Operations Segment
Oberpfaffenhofen*



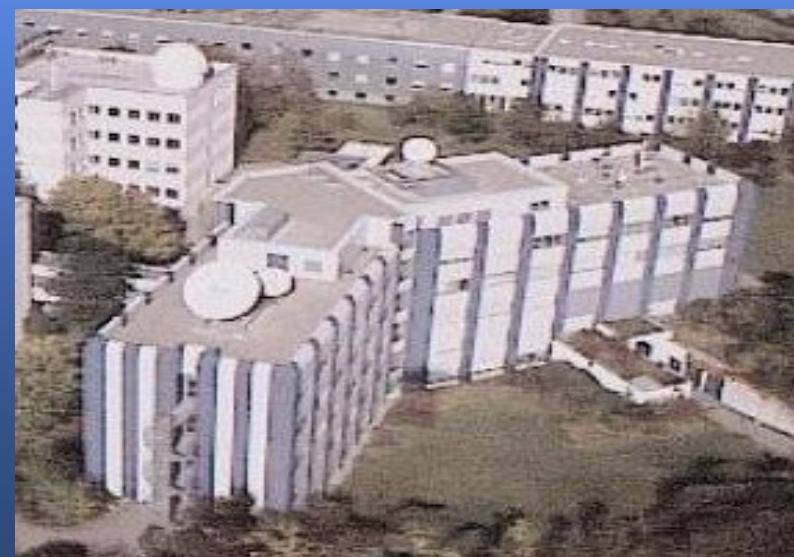
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TerraSAR-X Ground Segment – Mission Operations



*DLR Ground Station
Neustrelitz*



*DLR Payload
Ground Segment
Oberpfaffenhofen*



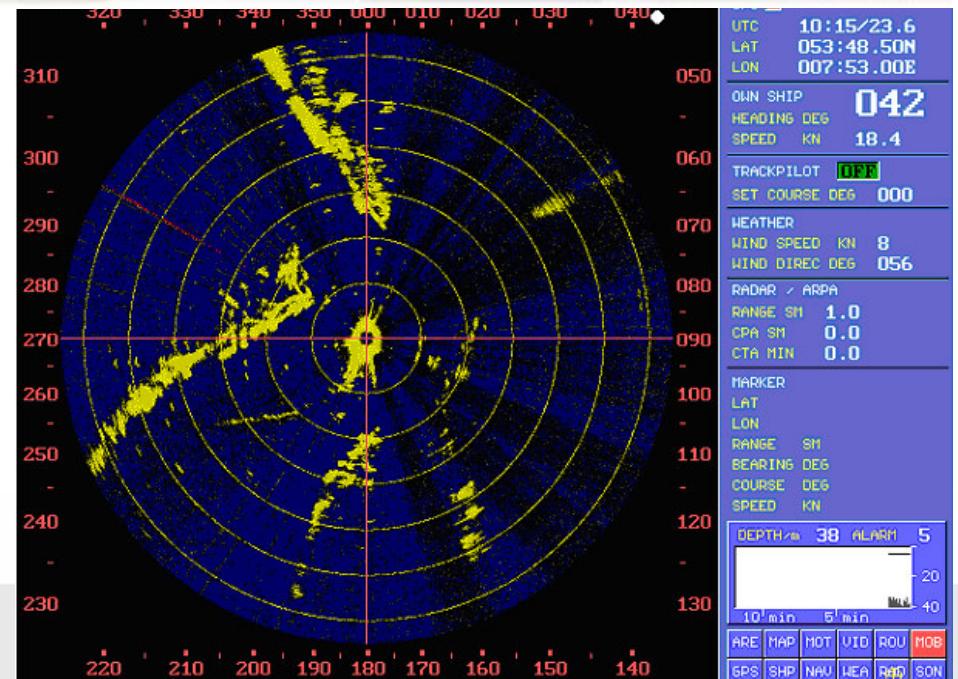
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Radar characteristics



- ☛ Radio detection and ranging (active system)
- ☛ Transmits signals
- ☛ Receives echoes
- ☛ Visualization of radar echoes
- ☛ All weather & day, night observation capability

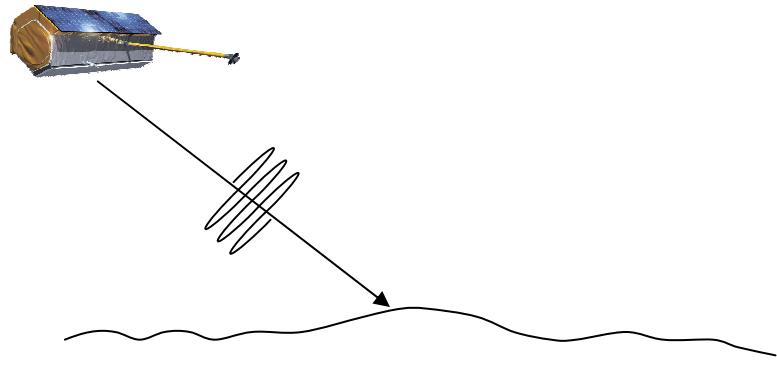


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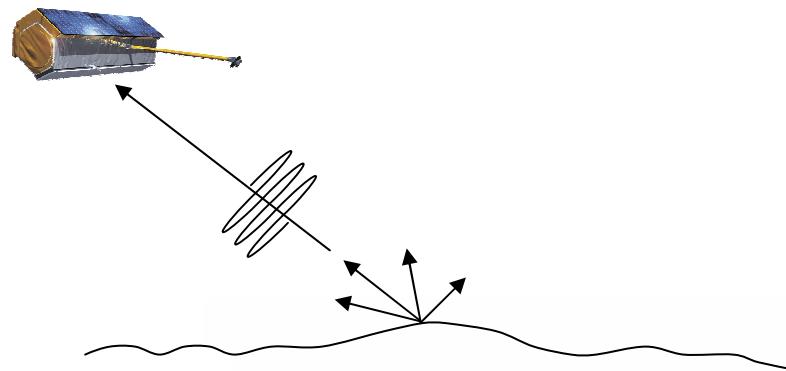
What does the radar measure?

Brightness of features in radar imagery depends on portion of energy that is backscattered to the SAR system



Radar transmits a pulse (traveling velocity is equal to speed of light)

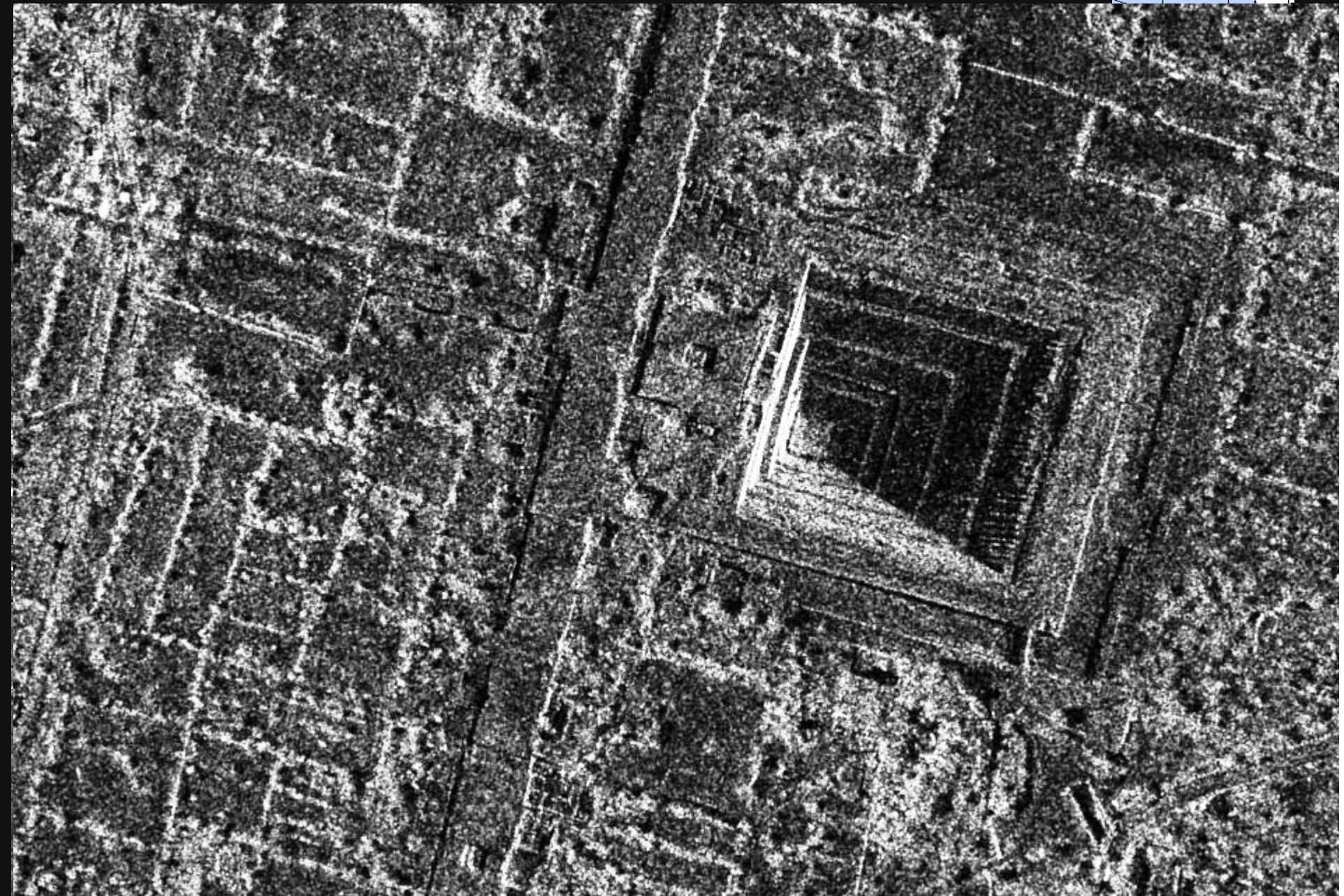
Some of the energy is reflected back to the sensor. The radar measures the radar backscatter σ_0 (sigma naught or sigma zero)



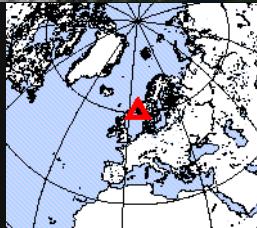
Backscatter properties

- ↗ Surface roughness
- ↗ Dielectric properties
- ↗ Imaging and surface geometry

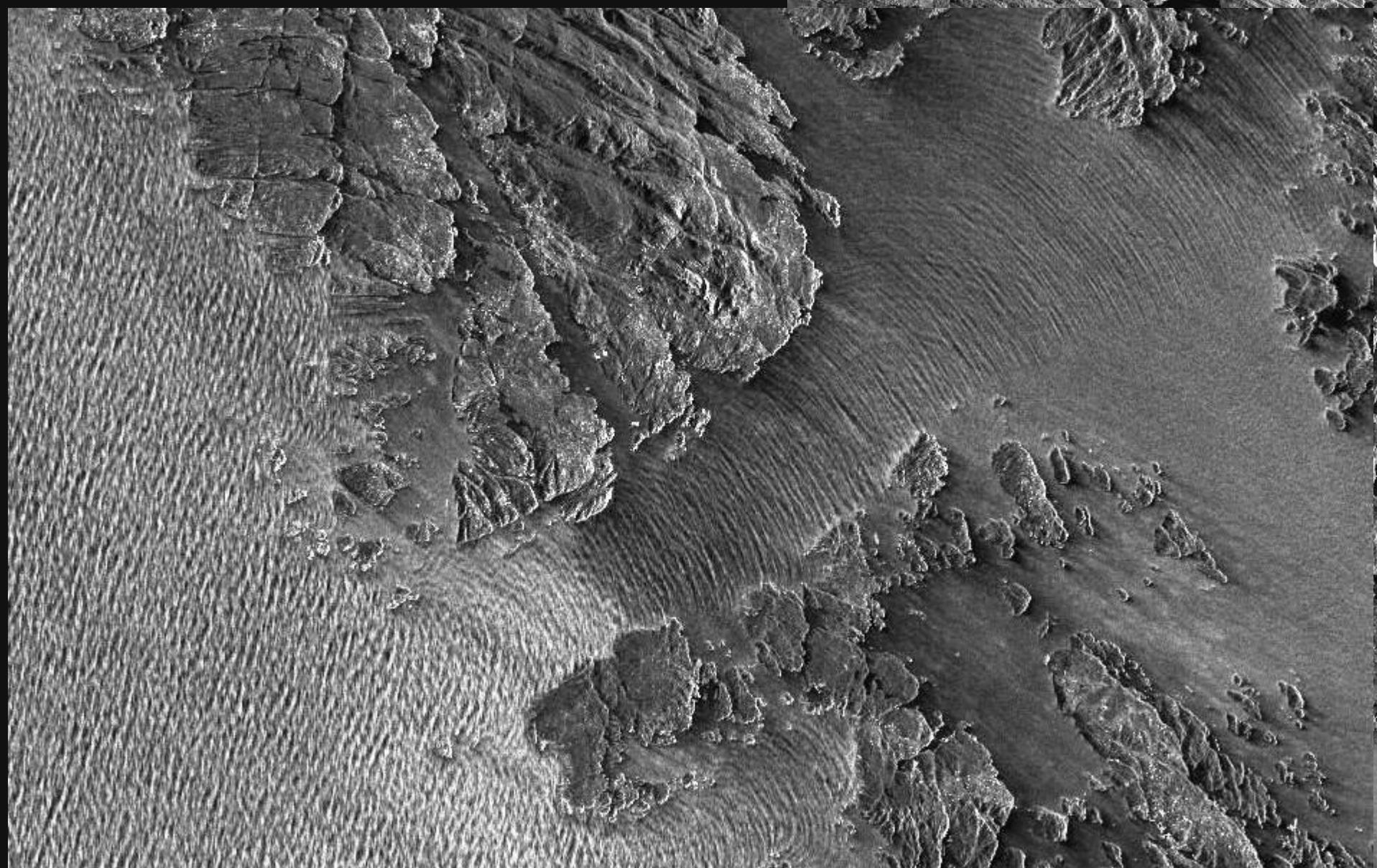
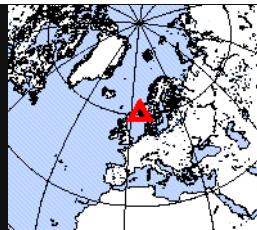
Spotlight Image: Teotihuacán



TSX-StripMap:
Bergen, Norway
March 13, 2008

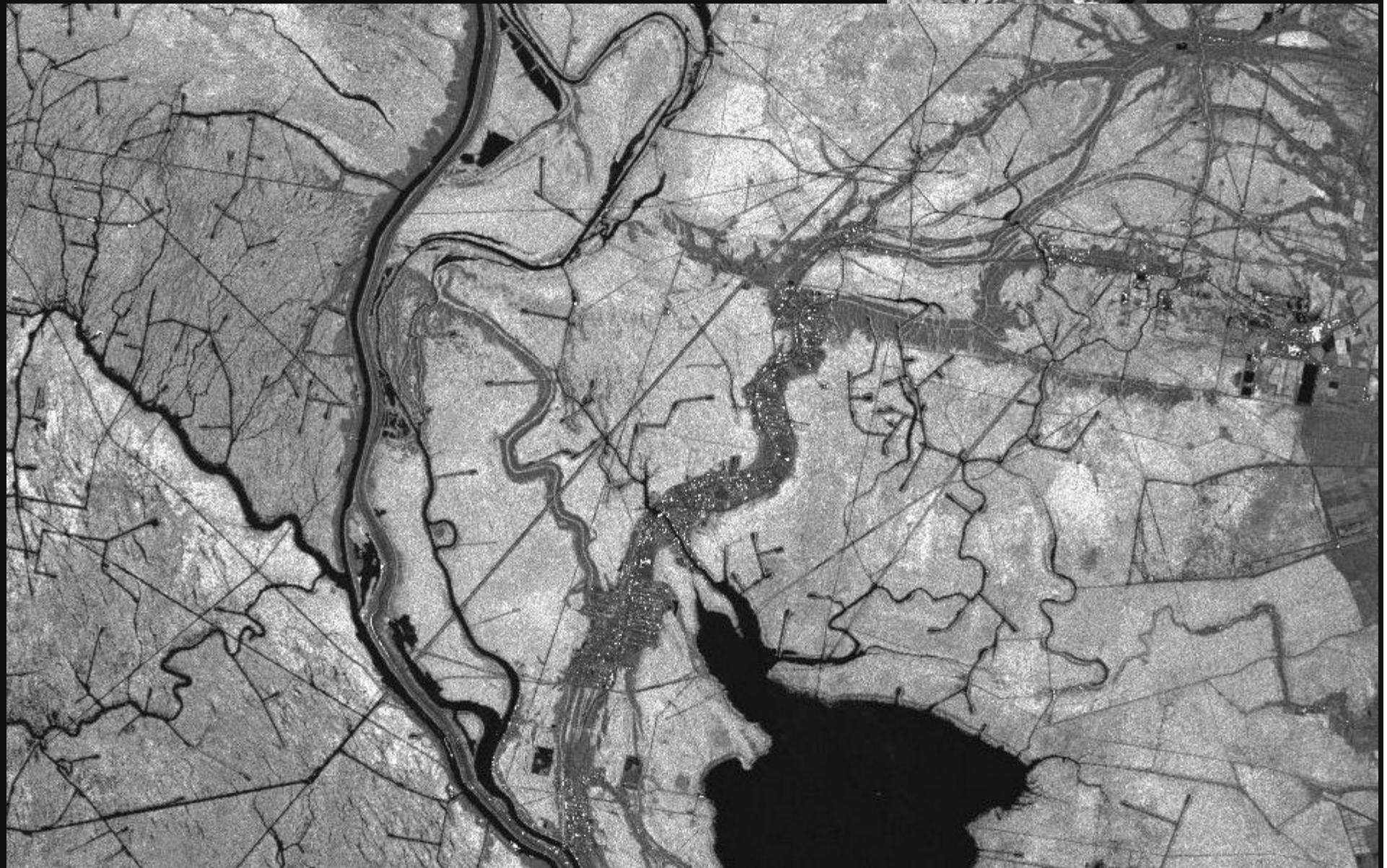
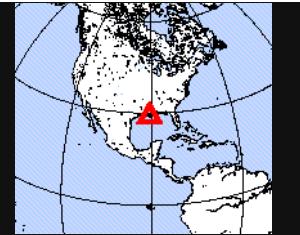
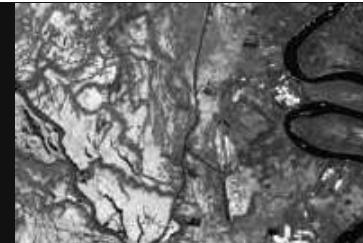


TSX-StripMap: Bergen, Norway

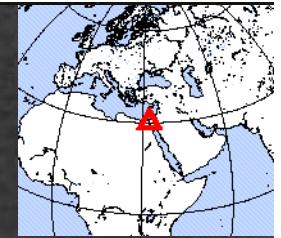
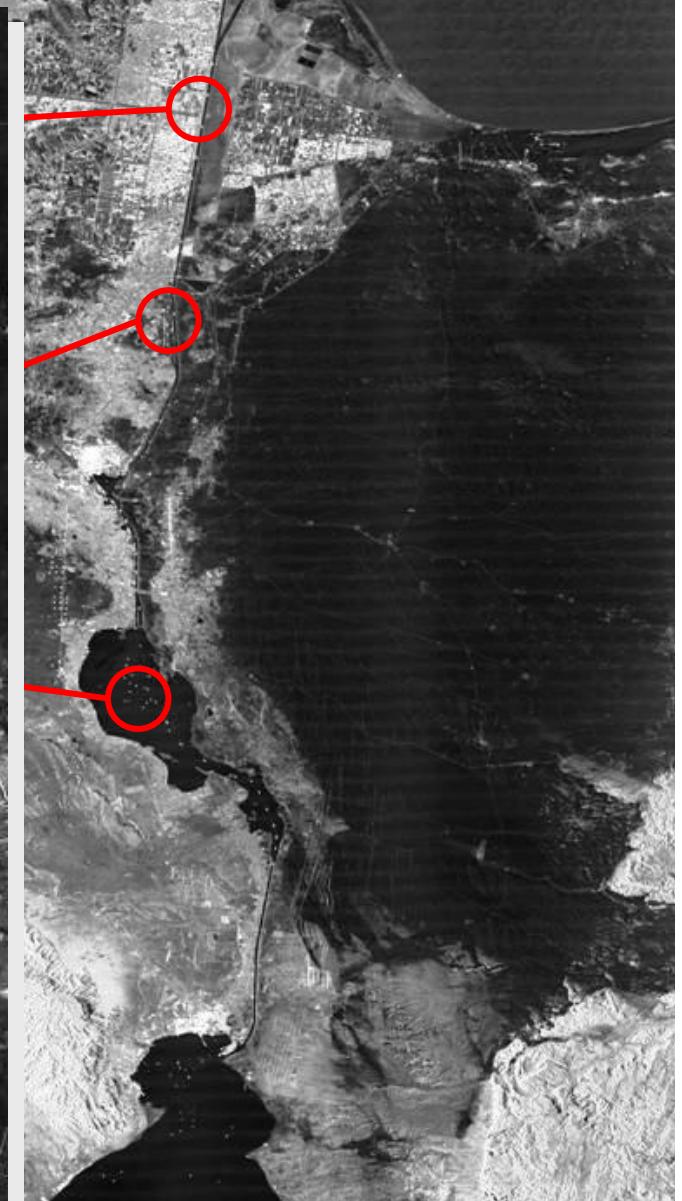


TSX-StripMap: Mississippi Delta

February 1st, 2008

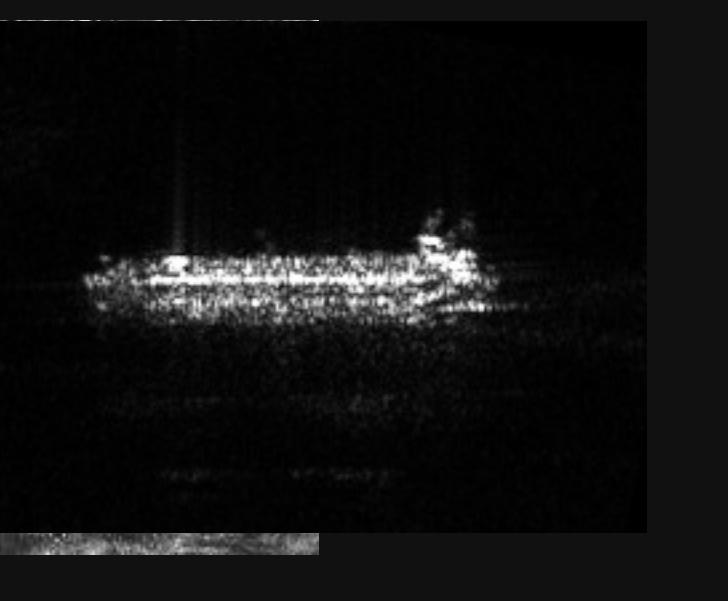
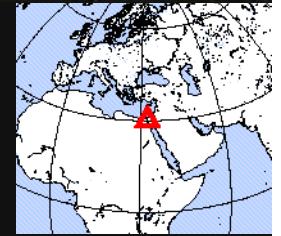


**TSX-Sc
Suez-Ca**



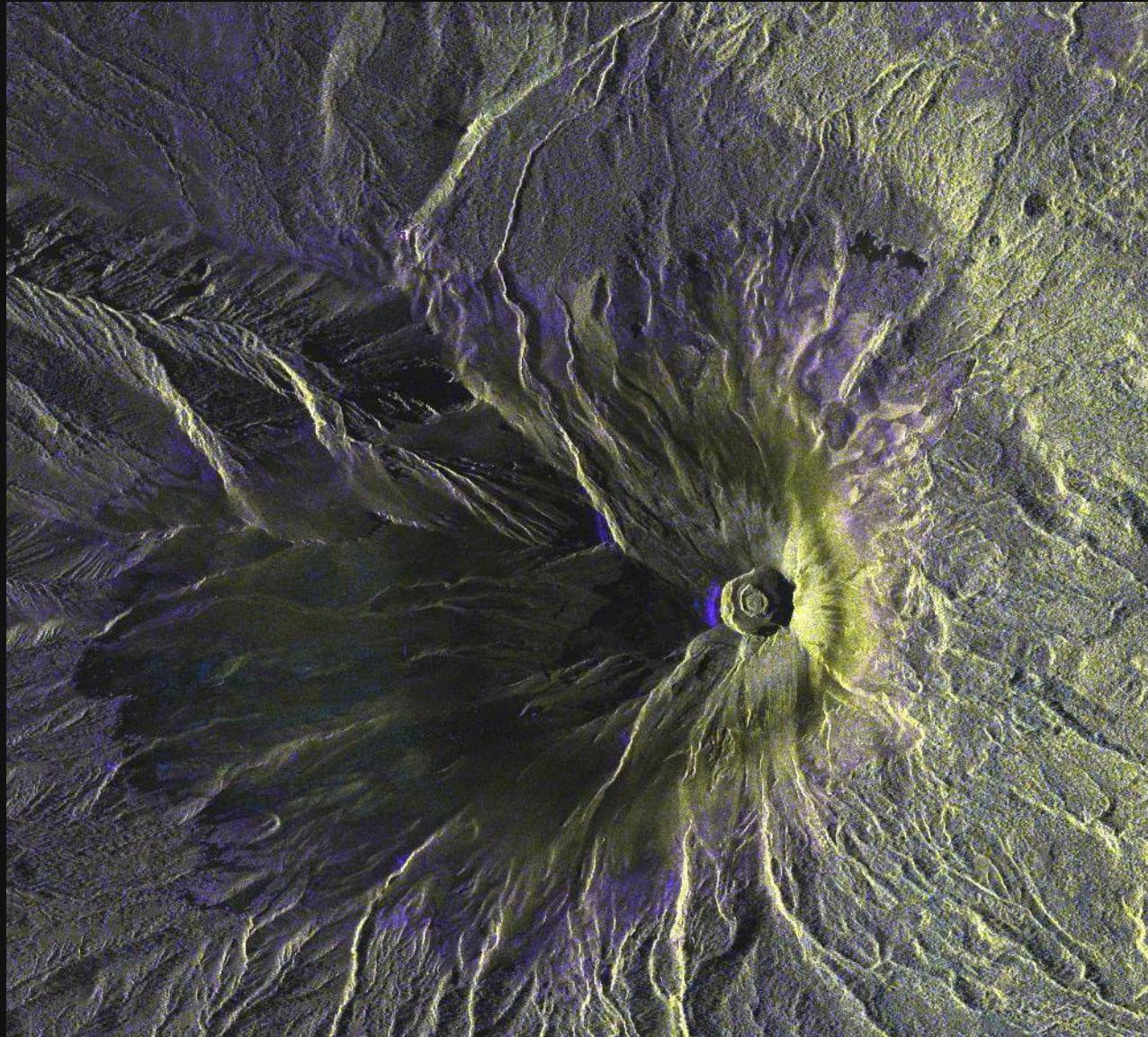
TSX-Spotlight: Suez-Canal

February 11, 2008



TSX-Spotlight: Popocatepetl Volcano

March 14, 2008 - Dual Pol (HH/VV)





Access to TerraSAR-X data for scientific use

- ↗ Data policy issues
 - ↗ Commercial exploitation: EADS-Astrium
 - ↗ Scientific utilization: DLR
 - ↗ Both parties equally share the satellite resources
 - => proposal
- ↗ National security regulations:
 - ↗ Satellitendatensicherheitsgesetz (Sat DSIG)
 - ↗ Resolution and phase information
 - ↗ Urgency of the product provision (<5 days)
 - ↗ Users / people having access to the data



Access to TerraSAR-X data for scientific use

- ↗ The status is gained via a selection process
 - ↗ proposal submission
 - ↗ evaluation (mission objectives, data requirements, scientific use criteria)
- ↗ General proposal submission (since October 2007):
 - ↗ Submission at any time
 - ↗ Data are provided for the costs of fulfilling the user request
- ↗ Announcement of Opportunity
 - ↗ Related to specific topics
 - ↗ Special conditions
 - ↗ Next AOs planned for
 - ↗ Experimental modes
 - ↗ synergistic use with Rapid Eye
 - ↗ other SAR frequencies





Access to TerraSAR-X data for scientific use

- ↗ Accepted proposals:
 - ↗ Creation of a proposal specific user account
 - ↗ quota of products for the agreed purpose.
 - ↗ priority
- ↗ The provision of data requires
 - ↗ the signature of the user license agreement
 - ↗ the list of people having access to the TerraSAR-X data
 - ↗ the confirmation of the corresponding funding

TerraSAR-X Science Service System - Netscape

Datei Bearbeiten Anzeigen Gehe Lesezeichen Extras Fenster Hilfe

http://sss.terrasar-x.dlr.de/cgi-bin/h.cgi?page=home

eMail AIM Anfang My Netscape.de Suche Lesezeichen

TMSP Product Verification TerraSAR-X Science Service System

Deutsches Zentrum für Luft- und Raumfahrt in der Helmholtz-Gemeinschaft

Home Proposals Investigators Evaluators Change Password Search Impressum Print Version

TerraSAR-X Science Service System

The TerraSAR-X Science Service System allows for the submission and evalution of proposals, as well as for the submission of reports. It is further used to monitor and track proposals and therewith help to organize the science user community of TerraSAR-X.

Depending on who you are and what you like to do you have the following possibilities to proceed via the sidemenu on the left of this page:

- Anybody may receive information about which **proposals** are accepted and read their executive summaries.
- Principal **investigators** of TerraSAR-X data may enter and maintain their proposals and are able to submit reports. Proposals and reports should be in English.
- **Evaluators** may receive detailed information about the proposals they have been appointed to and submit their comments and rating.

The pdf document: **How to submit a TSX proposal** gives a short description of the procedure for submitting proposals.

Investigator will get the data for the costs of fulfilling the user request. Discounts will be applied for larger order volumes, and for dedicated research programs and institutions contributing to the TerraSAR-X mission, especially by financial or operational support. Special conditions might be applied for the AOs.

NEW The current **COFUR pricelist** is applicable to proposals presented to the permanent submission interface.

NEW The Science Service System is now open for the submission of general proposals.

ATTENTION: The download of TerraSAR-X data requires special security regulations which are described in the **FAQ** document.

Proposal submission: <http://sss.terrasar-x.dlr.de>

Documentation etc: http://www.dlr.de/tsx/start_en.htm

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Netscape icons: eMail AIM Anfang My Netscape.de Suche Lesezeichen

DLR logo: DLR

Proposal Submission Interface - Executive Summary -Netscape

Datei Bearbeiten Anzeigen Gehe Lesezeichen Extras Fenster Hilfe

http://s120993593.alturo-host.de/cgi-bin/secure/investigators/h.cgi

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Proposal Submission Interface - Executive ...

 DLR German Aerospace Center

TERRA SAR X

Home / Investigators / Proposal Submission Interface - Executive Summary

You are logged in as: aroth
You are editing proposal: LAN0002

Executive Summary

Executive Summary

The provision of a concise resume of the proposal is required.
It shall describe the objectives, method, data requirements and deliverables.
The funding must be specified. (maximum 4000 characters)

<p>Istanbul is a "megacity". As a commercial and cultural metropolis, Istanbul is becoming more and more important in a global context. As a consequence of rapid development the megacity is facing numerous problems. Explosive population growth, uncontrolled urban sprawl, housing at hazardous areas or bad building materials in combination with a significant risk of a major earthquake present acute danger to the population. Substantial and up-to-date data are the premise of an effective crisis management. Assessing vulnerabilities of Istanbul are fundamental to enabling preventive measures before an expected earthquake disaster and preparing for the post-earthquake response.</p>

Schedule

The schedule must show the project duration, it's phases (preparation, data acquisition, analysis) as well as the plan for the reporting of preliminary and final results. (maximum 2000 characters)

<p>Phase A: Preparation with optical data (until 12/06)</p><p>Phase B: Algorithm adaptation and TS-X data acquisition (01/06 - 03/07)</p><p>Phase C: Vulnerability map of Istanbul (01/07 - 06/07)</p><p>Phase D: Development of change detection algorithms and acquisition of time series (07/07 - 06/08)</p>

Back Next

DLR 2005

Proposals -Netscape

Datei Bearbeiten Anzeigen Gehe Lesezeichen Extras Fenster Hilfe

http://sss.terrasar-x.dlr.de/cgi-bin/secure/none/h.cgi?page=proposals

eMail AIM Anfang My Netscape.de Suche Lesezeichen

Proposals

Deutsches Zentrum für Luft- und Raumfahrt in der Helmholtz-Gemeinschaft

Home / Proposals

List of accepted Proposals

The following table gives a complete overview about all accepted proposals. The proposal id links to the proposal's executive summary (only for 'non-confidential' proposals)

Proposal Id	Title	Investigator
CAL0107	FLUX-X Winds, waves and air-sea fluxes in the Southern Ocean - a study of extreme conditions - with a surface mooring and TerraSAR-X	Drennan, William - University of Miami, RSMAS, Applied Marine Physics
CAL0109	Validation of TerraSAR-X Mapping Precision for Land Cover and Disaster Monitoring	Suga, Yuzo - Hiroshima Institute of Technology, Dept. of Environmental Information Studies
CAL0137	Interferometric Calibration and Verification	Eineder, Michael - DLR, IMF
CAL0138	Calibration and Validation of TerraSAR-X in Mongolia	Sato, Motoyuki - Tohoku University, Center for Northeast Asian Studies
CAL0163	Geometric Validation of TerraSAR-X High-Resolution Products	Meier, Erich - Remote Sensing Laboratories (RSL), Geography
CAL0166	Validation of spectral and individual ocean Wave parameters at offshore platforms VW-X	Lechner, Susanne - German Aerospace Center, MF
CAL0196	Validation of the TerraSAR performances by using airborne SAR (Pi-SAR) and ground experiments	Uratsuwa, Seiho - National Institute of Information and Communications Technology, Applied Research and Standards Department
CAL0264	TerraSAR-X products geometrical calibration and validation	Arnaud, Alain - ALTAMIRA INFORMATION, Research and Development
COA0025	Investigations of meso-scale dynamics associated with marine sand waves in the tidal channel of the Lister Tief in the German Bight of the North Sea by using TerraSAR-X data (MESODYNTSX)	Hennings, Ingo - Leibniz-Institut fuer Meeresswissenschaften an der Universitaet Kiel IFM-GEOMAR, Ozeanzirkulation und Klimadynamik
COA0047	Investigation of intertidal zone using TerraSAR-X	Won, Joong-Sun - Yonsei University, Earth System Sciences
COA0061	Coastal zone mapping and monitoring using SAR	Yang, Chan-Su - KORDI (Korea Ocean Research & Development Institute), Ocean Satellite Research Group
COA0065	Ocean Winds from Terra SAR X	Horstmann, Jochen - GKSS Research Center, Institute for Coastal Research



EOWEB User Interface (TerraSAR-X)

Cluster AF Earth Observation Data - Windows Internet Explorer bereitgestellt von T-Systems SFR

http://centaurus.caf.dlr.de:8080/

Datei Bearbeiten Ansicht Favoriten Extras ?

EOWEB - Earth Observation ... Cluster AF Earth Observ... X Seite Extras >

EOWEB®

Applied Remote Sensing Cluster Home | Imprint | Contact Mon, 17 Mar 2008

EOWEB®
Earth Observation on the WEB

http://centaurus.caf.dlr.de:8080

DLR EOWEB® - Next Generation (EOWEB-NG)
The user interface Earth Observation on the WEB provides access to the earth observation data available at the DFD. You can search for catalogue data, view browse images, order catalogue data, specify and order future acquisitions.
The following products are available via EOWEB-NG:

- TerraSAR-X products (Access is restricted to privileged users only!)

→ Access

DLR EOWEB®
The user interface Earth Observation on the WEB provides access to the earth observation data available at the DFD. You can search for data, view browse images, order data and retrieve data on-line.
→ Access

Announcement of NOAA-18 AVHRR data reception by DFD
On January 1st, 2007, DLR - DFD has started on an operational basis the reception of NOAA-18 AVHRR data replacing NOAA-17 AVHRR. The performance of our reception of NOAA-17 AVHRR data degraded in the last months. On April 1st, 2007, DLR - DFD also started the operational processing of NOAA-18 AVHRR data to generate daily, weekly or monthly NOAA18-AVHRR products as NDVI, LST or SST maps. In order to test the performance of our processing chains, we processed simultaneously all NOAA-17 and NOAA-18 data from January 1st, 2007 till March 29th, 2007. All products will be available via EOWEB. Please remember that NOAA-18 is a PM sensor which passes central Europe about 1.5 hours later than NOAA-17 (about 11:30 UTC instead of 10:00 UTC for NOAA17). LST will be increased in general.

Other Data Services

World Data Center for Remote Sensing of the Atmosphere (WDC-RSAT)
The WDC-RSAT provides measurements and derived data products from a wide range of atmospheric sensors.
→ Access

EOS Data Gateway
The Earth Observing System Data Gateway provides access to worldwide distributed data. You can find and order data from multiple participating archives.
→ Access

EARTH OBSERVATION DATA

EOWEB User Interface (login)

EOWEB® Cluster Angewandte Fernerkundung [Home](#) | [Imprint](#) | [Contact](#) Mon, 17 Mar 2008

[Login](#) [Register](#) [Logout](#) [Help](#) Data in EOWEB [Search by ProductId](#) You are logged in as **anonymous user.**

[Save Query Parameters](#) [Load Query Parameters](#) Durchsuchen...

[Shop Cart](#) [Order Monitoring](#) [Catalogue](#) [Future Products / Acquisitions](#) [User Set](#)

Navigate Set Area Footprints

Collections: Deselect all Expand/collapse 0 Collections selected

Anonymous user has no access rights for this collections! Please login

Query Mode: Standard

Date: Choose a Date From: 2008-03-17 00:00:00 To: 2008-03-17 23:59:59

Area: Rectangle Center Lat/Lon: 0.000 Extension Lat/Lon: 180.000 360.000 Step by range



Start Search Results Display    

EOWEB User Interface (Catalogue search)

EOWEB® 

Cluster Angewandte Fernerkundung | Home | Imprint | Contact | Mon, 17 Mar 2008

Update User Data | Logout | Help | Data in EOWEB | Search by ProductId | You are logged in as aroth_LAN0002.

Save Query Parameters | Load Query Parameters | Durchsuchen...

Shop Cart | Order Monitoring

Catalogue | Future Products / Acquisitions | User Set

Collections :

Deselect all | Expand/collapse | 2 Collections selected

- TSX-1
 - TSX-1.SAR.L1b-ScanSAR
 - TSX-1.SAR.L1b-Stripmap
 - TSX-1.SAR.L1b-High-Resolution-Spotlight
 - TSX-1.SAR.L1b-Spotlight

Query Mode: Standard ▾

Date: Choose a Date ▾

Area: Rectangle ▾

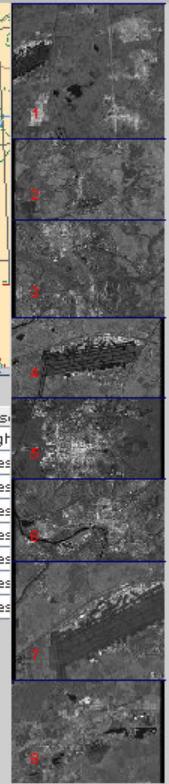
From: 2007-12-01 00:00:00 | To: 2008-03-17 23:59:59 | Center Lat/Lon: 50.051 | 8.579 | Extension Lat/Lon: 0.539 | 0.975 | Step by range ▾

Map View: Liege | Frankfurt am Main | Navigate | Set Area | Footprints

8 out of 8 items returned

#	Id	Abstract	Item Type	Mission	Sensor	Start Date	End Date	Sensor
*	1	TSX-1.SAR.L1b-Spotlight	CatalogueSce...	TSX-1	SAR	2007-12-02T05:34:29,5...	2007-12-02T05:34:31,0...	Spotlight
*	2	TSX-1.SAR.L1b-High-Resolution-Spotli...	CatalogueSce...	TSX-1	SAR	2007-12-07T05:42:58,2...	2007-12-07T05:42:58,9...	HighRes
*	3	TSX-1.SAR.L1b-High-Resolution-Spotli...	CatalogueSce...	TSX-1	SAR	2007-12-07T05:43:03,4...	2007-12-07T05:43:04,1...	HighRes
*	4	TSX-1.SAR.L1b-High-Resolution-Spotli...	CatalogueSce...	TSX-1	SAR	2007-12-10T17:08:58,8...	2007-12-10T17:08:59,5...	HighRes
*	5	TSX-1.SAR.L1b-High-Resolution-Spotli...	CatalogueSce...	TSX-1	SAR	2007-12-21T17:08:57,0...	2007-12-21T17:08:57,7...	HighRes
*	6	TSX-1.SAR.L1b-High-Resolution-Spotli...	CatalogueSce...	TSX-1	SAR	2007-12-29T05:43:02,9...	2007-12-29T05:43:03,6...	HighRes
*	7	TSX-1.SAR.L1b-High-Resolution-Spotli...	CatalogueSce...	TSX-1	SAR	2007-12-30T05:25:54,9...	2007-12-30T05:25:55,6...	HighRes
*	8	TSX-1.SAR.L1b-High-Resolution-Spotli...	CatalogueSce...	TSX-1	SAR	2008-01-01T17:08:56,2...	2008-01-01T17:08:57,0...	HighRes

Search Buttons: Start Search | Results | Display | Print | Save | Export | Help



EOWEB User Interface (Acquisition)

EOWEB® Cluster Angewandte Fernerkundung | Home | Imprint | Contact | Mon, 17 Mar 2008 | You are logged in as aroth_LAN0002.

Update User Data | Logout | Help | Data in EOWEB | Search by ProductId | Save Query Parameters | Load Query Parameters | Durchsuchen...

Shop Cart | **Order Monitoring** | Catalogue | Future Products / Acquisitions | User Set

Collections :

- Deselect all
- Expand/collapse
- 1 Collection selected

TSX-1 Future Products

- TSX-1 SAR L0 Spotlight future products
- TSX-1 SAR L0 High Resolution Spotlight future products
- TSX-1 SAR L0 Stripmap future products
 - TSX-1 SAR L0 Stripmap future coverages
 - TSX-1 SAR L0 Stripmap future scenes
 - TSX-1 SAR L0 ScanSAR future products

Acquisition Window: Choose a Date From: 2008-03-21 00:00:00,000 To: 2008-04-01 23:59:59,999 **Region of Interest:** Polygon Import Export Step by range

Region of Interest Map: A map showing a region around Liege, Belgium. It displays a grid with latitude and longitude coordinates. Two overlapping rectangular selection boxes are drawn on the map, one green and one red. A callout box in the bottom right corner states "Preview not available".

1 record selected

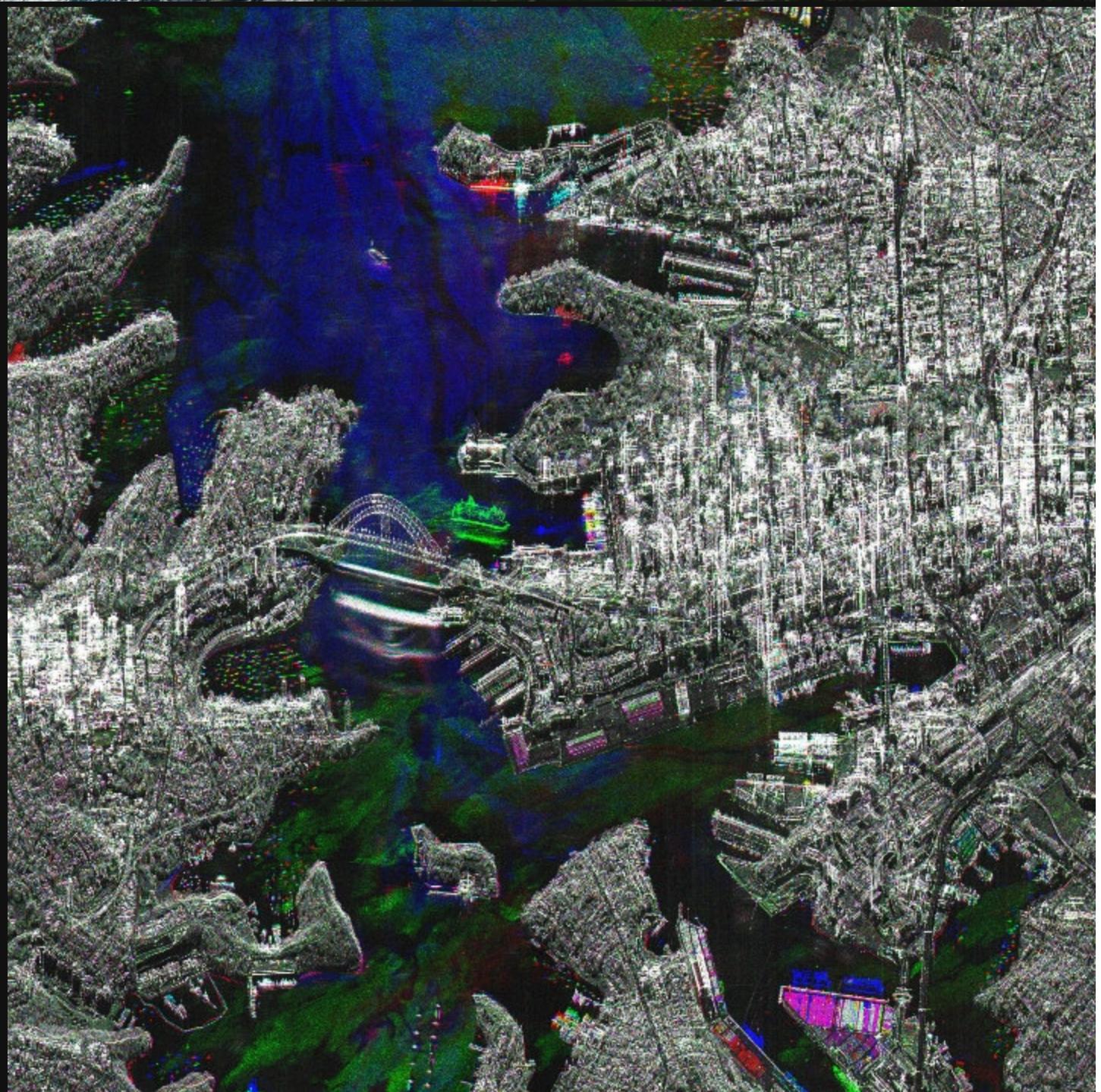
#	Id	Abstract	Item Type	Start Date	End Date	Sensor Mode	Polarization Mode	Size
1	PID_TSX-1.SAR.Stripmap...	FutureScene	2008-03-29T17:08:54.7...	2008-03-29T17:09:00.7...	Stripmap	Single	40	
2	PID_TSX-1.SAR.Stripmap...	FutureScene	2008-03-29T17:08:54.7...	2008-03-29T17:09:03.7...	Stripmap	Single	40	
3	PID_TSX-1.SAR.Stripmap...	FutureScene	2008-03-29T17:08:54.7...	2008-03-29T17:09:02.7...	Stripmap	Single	40	
4	PID_TSX-1.SAR.Stripmap...	FutureScene	2008-03-29T17:08:58.7...	2008-03-29T17:09:00.7...	Stripmap	Single	40	

Acquisition Criteria:

- Incidence Angle [degree] 30.00 - 40.00
 - Min. Incidence Angle [degree] 30.00
 - Max. Incidence Angle [degree] 40.00
- Pass Direction Ascending
- Looking Direction Right
- Polarization Mode Single

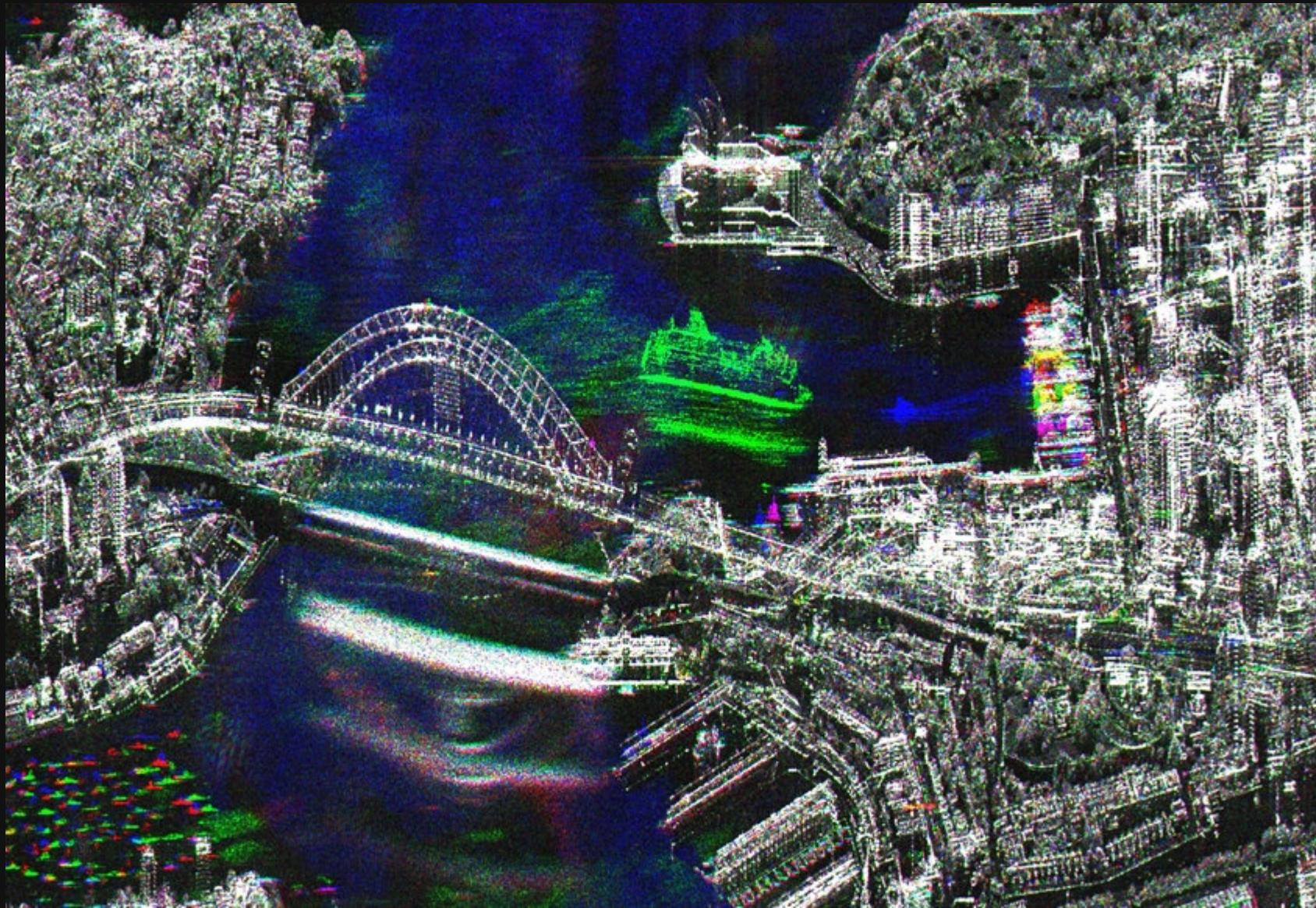
Buttons: Submit Query | Display | Print

TSX-Spotlight:
Sydney, Australia
r-g-b:
January 12, 2008
December 21, 2007
January 1, 2008



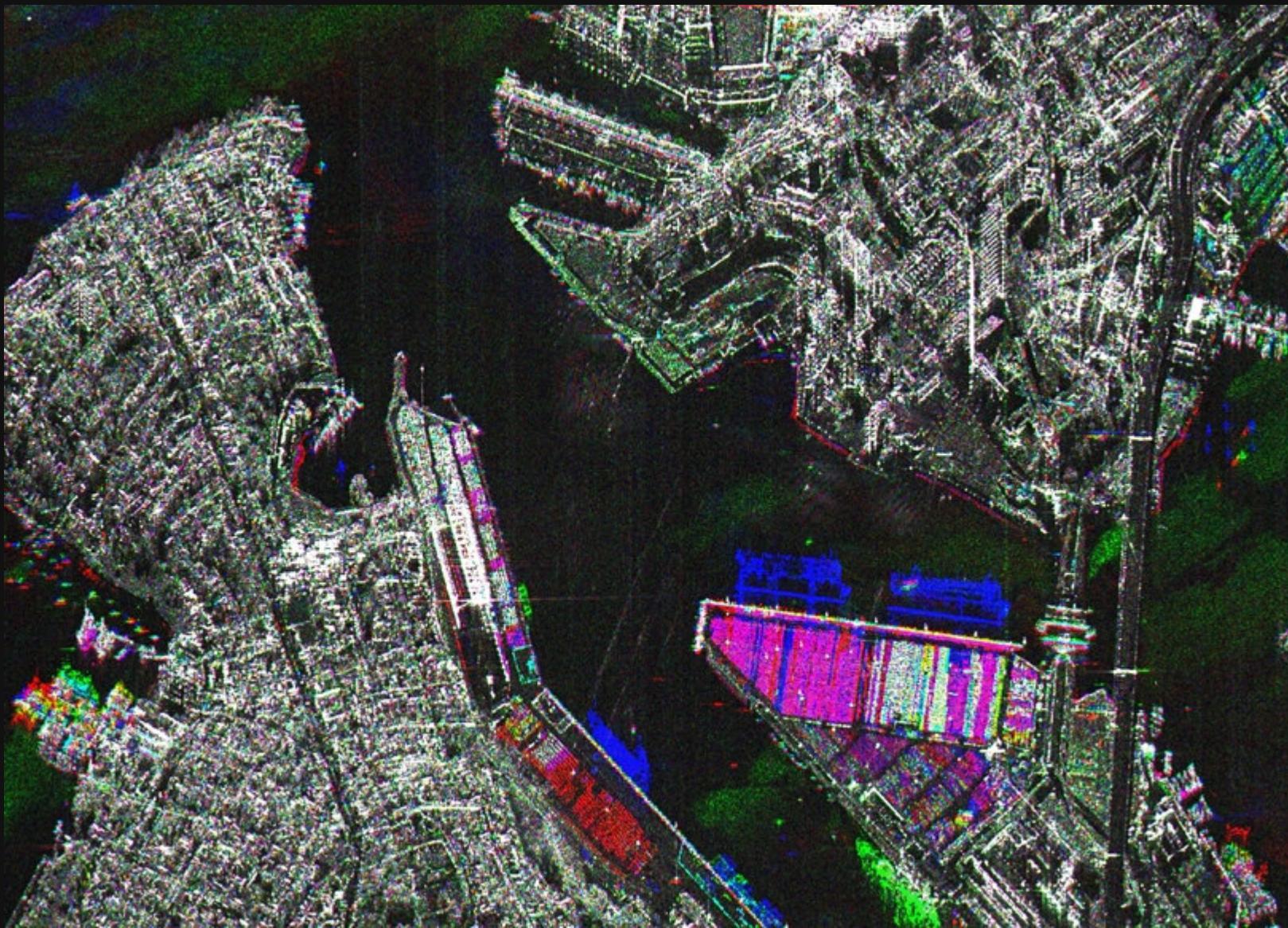
TSX-Spotlight: Sydney, Australia

r: January 12, 2008 – g: December 21, 2007 – b: January 1, 2008



TSX-Spotlight: Sydney, Australia

r: January 12, 2008 – g: December 21, 2007 – b: January 1, 2008



EOWEB User Interface (Shop cart)

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Update User Data | Logout | Help | Data in EOWEB | Search by ProductId | Durchsuchen... | You are logged in as aroth_LAN0002.

Save Query Parameters | Load Query Parameters | Shop Cart | Order Monitoring | Catalogue | Future Products / Acquisitions | User Set | Navigate | Set Area | Footprints

Liege

Preview not available

OrderOptions - Windows Internet Explorer bereitgestellt von T-Systems SfR
https://centaurus.caf.dlr.de:8443/eoweb-nc

Datei Bearbeiten Ansicht Favoriten Extras ?

Order Options

Order Service: DLR-DFD

Order Option: ProductType: L1b-MGD/GEC/EEC, UserGroup: Science Users

Acquisition Options

Polarization Channels HH

Extension of acquisition time window - 0 / + 0 cycle(s) (1 cycle = 11 days)

Processing Options

Processing Level L1B

Processor Gain Attenuation [dB] 0

Orbit Precision RAPID

Resolution Variant Spatially Enhanced (SE)

GIM (EEC only) No

Product Type Multi Look Ground Range (MGD)

Projection (if applicable) Auto

Delivery Options

Delivery Method: ftps

Product Medium: File

Product Format: --

Access Constraints: Product price per medium Euro TBD

Scene Selection

Scene Type: L1b-subscene

Product Starttime: 2008-03-29T17:08:54.733

Product Stoptime: 2008-03-29T17:09:03.733

1 record selected

Item Type	Mission	Sensor	Orbit	Start Date	End Date
tureScene	TSX-1	SAR	40	2008-03-29T17:08:54.7...	2008-03-29T17:09:03.7...

lay

Vertrauenswürdige Sites 100%

EOWEB User Interface (Order monitoring)

EOWEB®

Cluster Angewandte Fernerkundung | Home | Imprint | Contact | Mon, 17 Mar 2008

Update User Data | Logout | Help | Data in EOWEB | Search by ProductId | Durchsuchen...

Save Query Parameters | Load Query Parameters | You are logged in as aroth_LAN0002.

Shop Cart | **Order Monitoring** | Catalogue | Future Products / Acquisitions | User Set

Order Criteria

Order Id: *

Order Name: *

Order Status: All

Order Date: From: 2008-01-01 00:00:00 To: 2008-03-17 23:59:59

Map View

A map of Europe showing various locations marked with red stars. Labels include Belfast, Dublin, Leeds, Sheffield, Birmingham, Cardiff, London, The Hague, Bruxelles, Paris, Nantes, Odense, Hamburg, Bremen, Berlin, Lodz, Krakow, Brno, Linz, Vienna, Budapest, Vilnius, and Warsaw. A legend on the right indicates 'Footprints' with numbers 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24.

Table View

1 record selected

#	Id	Order Id	Order Name	Status	Status Details	Item
*	1	aroth_LAN0002_2008-02-20-08:09:48,2...	aroth_LAN0002_mexicocity_2_m...	orderCompleted	PROCESSED	
*	3	aroth_LAN0002_2008-02-14-08:42:09,8...	aroth_LAN0002_mexicocity1	orderCompleted	PROCESSED	
*	6	aroth_LAN0002_2008-03-10-14:14:42,8...	aroth_LAN0002	orderBeingProcess...	IN_PROCESSING	
*	9	aroth_LAN0002_2008-02-28-08:18:51,8...	aroth_LAN0002_belo_horizonte	orderCompleted	PROCESSED	
*	11	aroth_LAN0002_2008-02-14-21:27:50,2...	aroth_LAN0002-aircraft	orderCompleted	PROCESSED	
*	13	aroth_LAN0002_2008-01-10-07:23:17,7...	aroth_LAN0002_hyderabad	orderCompleted	PROCESSED	
*	16	aroth_LAN0002_2008-02-18-12:20:41,8...	aroth_LAN0002_mexicocity_2	orderCompleted	PROCESSED	
*	18	aroth_LAN0002_2008-01-21-11:20:02,9...	aroth_LAN0002_athen_mgd	orderCompleted	PROCESSED	
*	22	aroth_LAN0002_2008-02-29-09:33:11,1...	aroth_LAN0002	orderCompleted	PROCESSED	
*	24	aroth_LAN0002_2008-03-13-15:40:26,3...	aroth_LAN0002_monnem	orderBeingProcess...	IN_PROCESSING	

Buttons

Query Orders | Display | Search | Refresh



EOWEB User Interface (TerraSAR-X)

DLR Cluster Angewandte Fernerkundung

EOWEB
powered by DMS

You are logged in as anonymous user.

UserSet **ShopCart** **Orders**

Catalogue **FutureProducts/Acquisitions**

Collections :

- Deselect all
- Expand/collapse
- 1 Collection selected

- TSX-1 PN Gating Products
- TSX-1 System Products
- TSX-1 SAR LO Spotlights future products
- TSX-1 SAR LO High Resolution Spotlights future products
- TSX-1 SAR LO Stripmap future products
 - TSX-1 SAR LO Stripmap future coverages
 - TSX-1 SAR LO Stripmap future scenes
 - TSX-1 SAR LO ScanSAR future products

Query Mode: Advanced

Acquisition Window: Region of Interest:

Choose a Date

From:	To:
2006-11-11 00:00:00	2006-11-13 23:59:59

Acquisition Criteria:

Incidence Angle [degree] 20.0 - 60.0

Pass Direction Ascending/Descending

Looking Direction Right

Polarization Mode Single

Submit Query

Map View: A map of southern Germany and northern Switzerland showing acquisition footprints. The map includes latitude and longitude coordinates (e.g., 47.50, 10.75) and place names (e.g., LANDSHUT, FREISING, MÜNCHEN, FRANKFURT). Several colored rectangles (red, green, purple) indicate the acquisition windows for different scenes. A small inset map shows the satellite's position over Earth. A zoomed-in view of a specific area is shown in the bottom right corner.

Product Catalog:

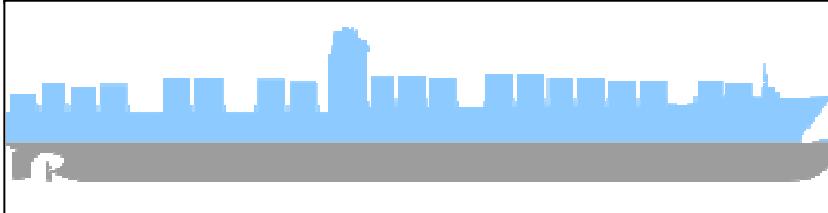
#	ID	Abstract	Product Type	Start Date	End Date
1	TSX-1 SAR LO Stripmap future scenes- sin...	single Scene-single-Stripm...	2006-11-13 05:26:...	2006-11-13 05:26:...	
2	TSX-1 SAR LO Stripmap future scenes- sin...	single Scene-single-Stripm...	2006-11-13 05:26:...	2006-11-13 05:26:...	
3	TSX-1 SAR LO Stripmap future scenes- sin...	single Scene-single-Stripm...	2006-11-13 05:26:...	2006-11-13 05:26:...	
4	TSX-1 SAR LO Stripmap future scenes- sin...	single Scene-single-Stripm...	2006-11-13 05:26:...	2006-11-13 05:26:...	
5	TSX-1 SAR LO Stripmap future scenes- sin...	single Scene-single-Stripm...	2006-11-13 05:26:...	2006-11-13 05:26:...	
6	TSX-1 SAR LO Stripmap future scenes- sin...	single Scene-single-Stripm...	2006-11-13 05:26:...	2006-11-13 05:26:...	



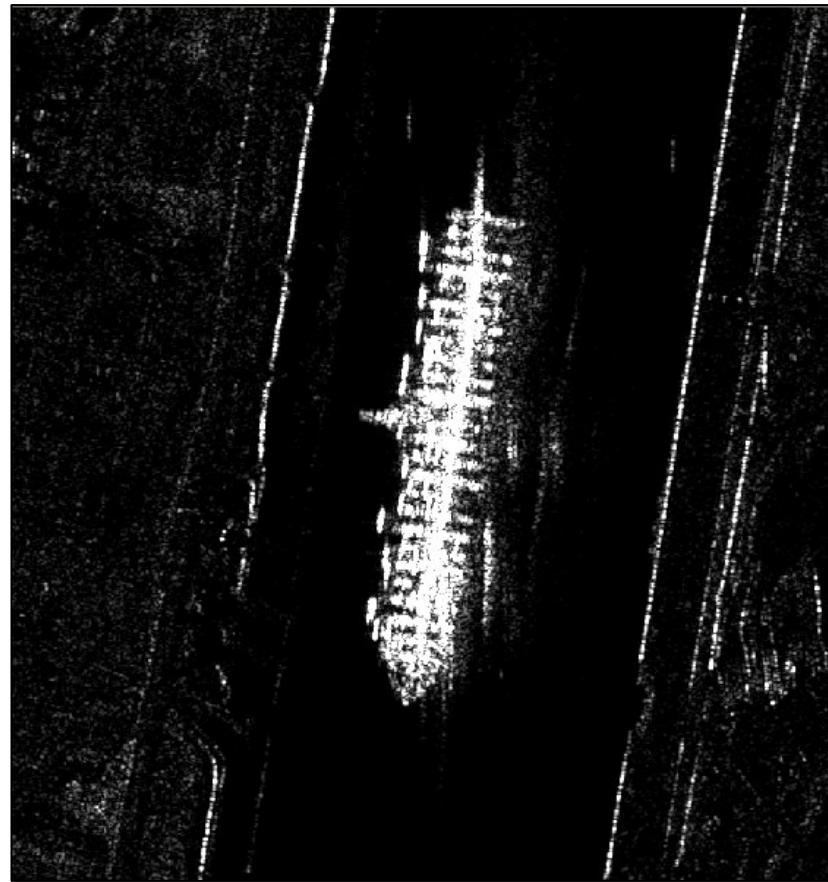
Image enhancement: Radiometric (Example “Ship”)



- ↗ Container ship
- ↗ Bridge almost in central position
- ↗ Length : ~ 400m (**397m**)
- ↗ Width: ~ 55m (**56m**)
- ↗ ~ 24 rows of containers (11 back, 13 front) (**23, 10/13**)



Container ship “Emma Mærsk”



Container ship captured by TerraSAR-X



Deutsches Zentrum
für Luft- und Raumfahrt e.V.
in der Helmholtz-Gemeinschaft