



Committee on Earth Observation Satellites

WGCapD

Distance Education Course: Webinar Series on  
SAR Data processing and applications

Webinar # 2

Date: April 24, 2017

## **SAR data access and SNAP**

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European Space Agency

ESA \ ESRIN, Italy

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## ERS-1/2 - SAR Level 1 Single Look Complex Image Product (SAR\_IMS\_1P)

### Product characteristics

<b>Pixel size</b>	8 m (range - across track) x 4 m (azimuth - along track – varying slightly depending on acquisition Pulse Repetition Frequency)
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<b>Scene area</b>	100 km (range) x at least 102.5 km (azimuth)
-------------------	--

## ERS-1/2 - SAR Level 1 Precision Image Product (SAR\_IMP\_1P)

### Product characteristics

<b>Pixel size</b>	12.5 m (range - across track) x 12.5 m (azimuth - along track)
-------------------	--

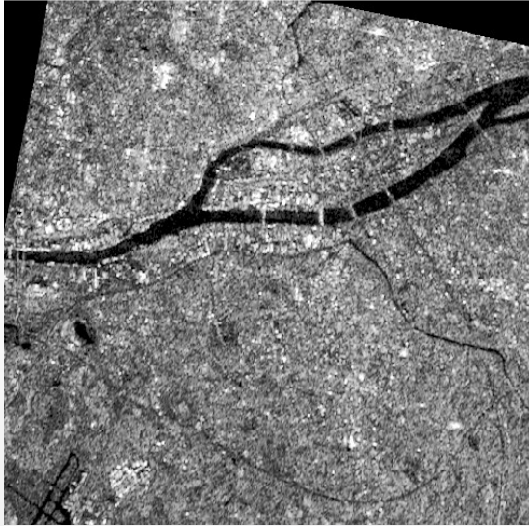
<b>Scene area</b>	100 km (range) x at least 102.5 km (azimuth)
-------------------	--

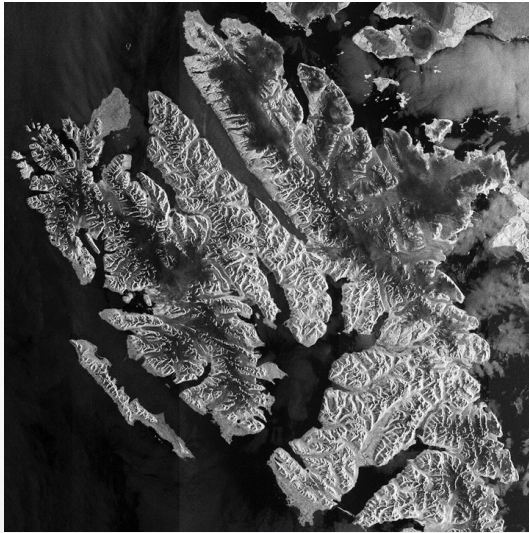
## ERS-1/2 - SAR Raw Image Product (SAR\_IM\_0P)

### Product characteristics

<b>Scene area</b>	100 km (range - across track) x full segment length (azimuth - along track)
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<b>Scene size</b>	5616 samples (range) x full segment length (azimuth)
-------------------	--



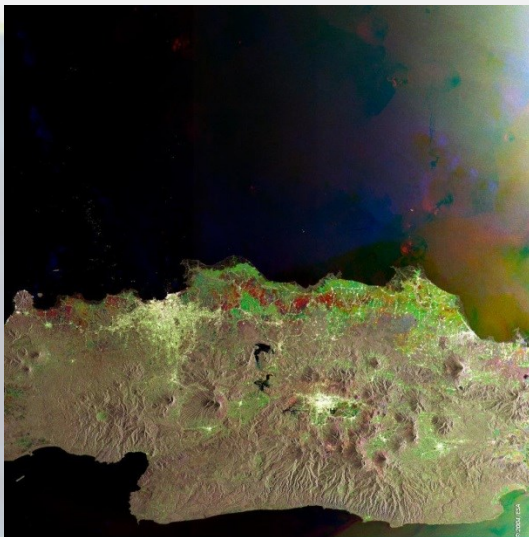


## ASAR Image Mode

ASA_IMS_1P	8m(r)x4m(a)	SLC
ASA_IMP_1P	30x30m	Multi-look, ground range
ASA_IM_0P		RAW

## ASAR Alternating Polarisation

ASA_APS_1P	8m(r)x4m(a)	SLC
ASA_APP_1P	30x30m	Multi-look, ground range
ASA_AP_0P		RAW



## ASAR Wide Swath

ASA_WSS_1P	8m(r)x80m(a)	SLC
ASA_WS_0P		RAW





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ERS



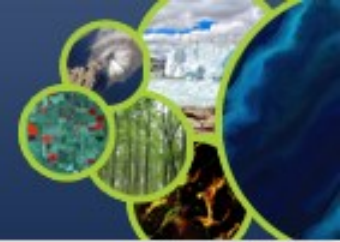
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LANDSAT

# ENVISAT and ERS 1,2

## On-The-Fly (OTF) processing



### - Dataset Details

#### Earth Topics (Applications)

- Natural Disasters  
Earthquake/Volcano
- Solid Earth  
Tectonics/Seismic Activity

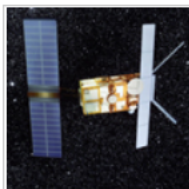
#### Instrument type

- Radar Imagery

#### Instrument

- SAR

#### Mission



#### ERS

**Operators:**  
ESA

**Date of Launch:**  
ERS-1 - 17 July 1991  
ERS-2 - 21 April 1995

**Mission Status:**  
ERS-1 ended on March 2000  
and ERS-2 September 2011

**Orbit Height:**

## ERS-1/2 - SAR Level 1 Single Look Complex Image Product (SAR\_IMS\_1P)

ERS  
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 Last update: 10 April 2017

The SAR SLC product is a single look complex acquired in Image Mode. It is phase preserved, generated from raw SAR data using up-to-date auxiliary products for use in SAR quality assessment, calibration and interferometric applications and interpolations are performed on the data. Absolute calibration parameters and product annotation.

#### Product characteristics

<b>Pixel size</b>	8 m (range - across track) x 4 m (azimuth - along track – varying slightly depending on acquisition Pulse Repetition Frequency)
<b>Scene area</b>	100 km (range) x at least 102.5 km (azimuth)
<b>Scene size</b>	5000 samples (range) x at least 30000 lines (azimuth)
<b>Pixel depth</b>	32 bits signed integer (16 bits I, 16 bits Q)
<b>Total product volume</b>	~ 575 MB
<b>Projection</b>	Slant range
<b>Number of looks</b>	1

#### Data Set Specifications

Spatial coverage: 82 N, 82 S, 180 W, 180 E  
Temporal coverage: 27-07-1991 - 04-07-2011  
Current Processor Version: PE ERS / Envisat format

[➡ GET DATA](#)

Data available immediately or after data request approval (a few days, maximum of 2 weeks). PRI and SLC are quicker and level 0 takes longer...

# TPM data access via ESA

https://earth.esa.int/web/guest/data-access

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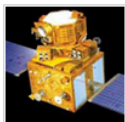
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## Most popular mission data products



[ResourceSat-1/IRS-P6 archive](#)  
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ResourceSat-1/IRS-P6 archive products are available as:  
Sensor Type Resolution (m) Coverage (km x...

[ResourceSat-1/IRS-P6](#)



[SPOT1-5 ESA archive](#)  
(725) recent views

The ESA SPOT1-5 collection is a dataset of SPOT-1 to 5  
Panchromatic and Multispectral products that ESA

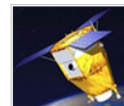
[SPOT-5](#)



[Pleiades ESA archive](#)  
(664) recent views

The Pleiades ESA archive is a dataset of Pleiades-1A and  
1B products that ESA collected over the years. The  
dataset regularly grows as ESA collects new...

[Pleiades](#)



[SPOT-6 and 7 ESA archive](#)  
(670) recent views

The SPOT-6 and -7 ESA archive is a dataset of SPOT-6  
and SPOT-7 products that ESA collected over the years.

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https://earth.esa.int/web/guest/data-access/browse-data-products?p\_p\_id=datasetlist\_WAR\_ospportlet&p\_p\_lifecycle=0&... EO training education ESA

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- Ocean and Coast (6)
- Snow and Ice (0)
- Solid Earth (0)

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- Digital Surface Model (0)
- Gravimetry (0)
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- Optical/Multi Spectral Radiometry Low/Medium Resolution (0)
- Orbit parameters (0)

Filter by Instruments

- AATSR (0)
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order by Name Ascending

**TerraSAR-X/TanDEM-X High Resolution SpotLight (basic and interferometry products)**  
(250) recent views

TerraSAR-X image products can be acquired in 6 image modes with flexible resolutions (from 0.25m to 40m) and scene sizes. Thanks to different polarimetric combinations and processing levels the delivered imagery can be tailored specifically to meet the requirements of...

TerraSAR-X

**Dataset available upon positive evaluation of Project Proposal (usually 2 weeks).**

→ GET DATA

**TerraSAR-X/TanDEM-X ScanSAR (basic products and maritime pack)**  
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TerraSAR-X/TanDEM-X Image Products can be acquired in 6 image modes with flexible resolutions (from 0.25m to 40m) and scene sizes. Thanks to different polarimetric combinations and processing levels the delivered imagery can be tailored specifically to meet the...

TerraSAR-X

→ GET DATA

**TerraSAR-X/TanDEM-X SpotLight (basic products and interferometry pack)**  
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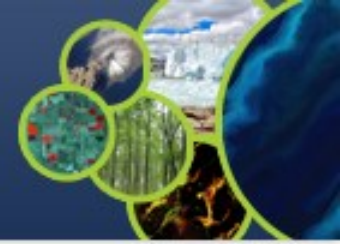
TerraSAR-X

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**TerraSAR-X/TanDEM-X Staring SpotLight (basic products and interferometry pack)**  
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TerraSAR-X



- Registration\ log in
- Acceptance of terms and conditions
- Product download through EOLI-SA client

**\*\*some specific datasets (e.g RAW) are available upon positive evaluation of the data service request**



# Sentinel-1 Data Access

<https://scihub.copernicus.eu/>



## Welcome to the Sentinels Scientific/Other use Data Hub

The [Sentinels](#) Scientific Data Hub provides complete, free and open access to [Sentinel-1](#) and [Sentinel-2](#) user products, starting from the In-Orbit Commissioning Review (IOCR).



Scientific Hub



API Hub



S-3 PreOps Hub



User Guide



Roadmap

## Access Points

**Scientific Hub** : access point for all sentinel mission with access to the interactive graphical user interface.

**API Hub** : access point for API users with no graphical interface. All API users regularly downloading the latest data are encouraged to use this access point for a better performance.

**Sentinel-3 Pre-operational Hub** : pre-operational access point for all users to Sentinel-3 data. Login credentials are `s3guest:s3guest`.

For more details or request of help support please send an e-mail to [eosupport@copernicus.esa.int](mailto:eosupport@copernicus.esa.int)

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☰ Insert search criteria... 🔍



# Sentinel-1 Data Access

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https://scihub.copernicus.eu/dhus/#/home

## Sentinels Scientific Data Hub

Insert search criteria...

### Advanced Search

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» Sort By: Ingestion Date ▼

» Order By: Descending ▼

» Sensing period From:  to:

» Ingestion period From:  to:

☐ Mission: Sentinel-1

Satellite Platform

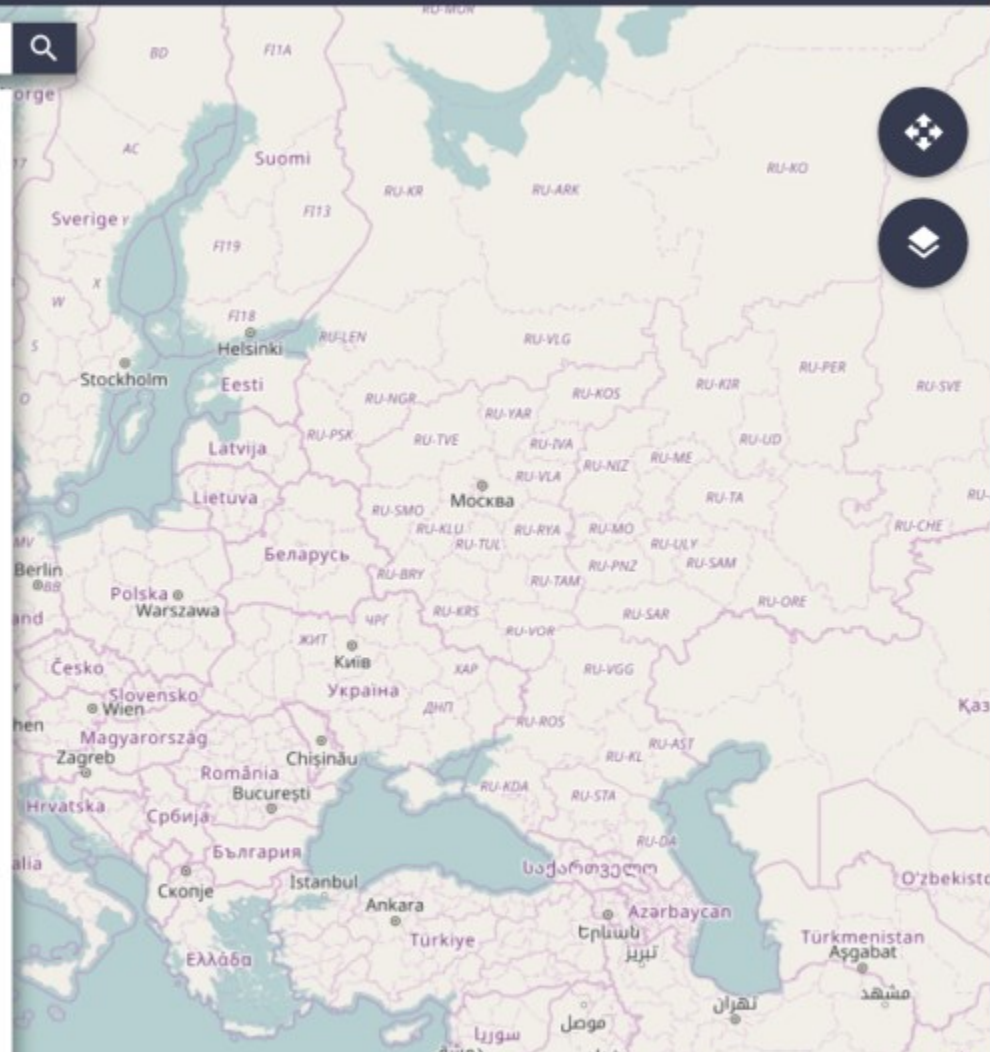
Product Type

Polarisation

Sensor Mode

Relative Orbit Number (from 1 to 175)

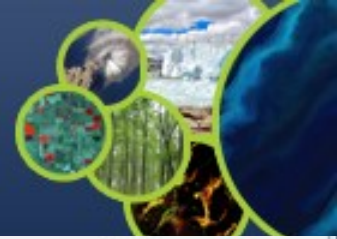
Collection





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Insert search criteria...

Display 1 to 25 of 695 products. Order By: Ingestion Date ↓

Select All

Request Done: ( footprint:"Intersects(POLYGON((12.335950861923127 41.73745666030317,12.733054236850705 41.73745666030317,12.733054236850705 10.000000000000000,10.000000000000000 41.73745666030317)))" )

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Mission: Sentinel-1; Instrument: SAR-C; Sensing Date: 2016-12-01T17:05:27.442Z; Si

**S1A SAR-C S1A\_IW\_GRDH\_1SDV\_20161201T170528\_20161201T170553\_014189\_01...**

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Mission: Sentinel-1; Instrument: SAR-C; Sensing Date: 2016-12-01T17:05:28.818Z; Si

**S1A SAR-C S1A\_IW\_RAW\_\_0SDV\_20161201T170525\_20161201T170557\_014189\_01...**

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Mission: Sentinel-1; Instrument: SAR-C; Sensing Date: 2016-12-01T17:05:25.118Z; Si

**S1A SAR-C S1A\_IW\_SLC\_\_1SDV\_20161130T051947\_20161130T052014\_014167\_016...**

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Mission: Sentinel-1; Instrument: SAR-C; Sensing Date: 2016-11-30T05:19:47.723Z; Si

**S1A SAR-C S1A\_IW\_OCN\_\_2SDV\_20161130T051948\_20161130T052013\_014167\_01...**

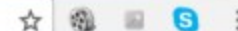
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Mission: Sentinel-1; Instrument: SAR-C; Sensing Date: 2016-11-30T05:19:48.988Z; Si

Map controls: BlackMarble, Road, Satellite

# SNAP toolbox



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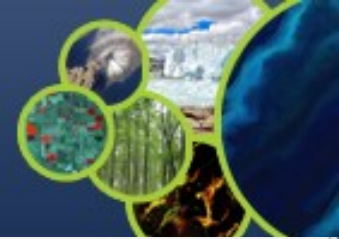


Polarimetry Course 2017

**SEOM STUDIES RESULTS**







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# step

science toolbox exploitation platform



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- SNAP
- Sentinel 1 Toolbox
- Sentinel 2 Toolbox
- Sentinel 3 Toolbox
- SMOS Toolbox
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- Useful Links

Home > Scientific Toolbox Exploitation Platform

## multimission scientific toolboxes

ESA is developing **free open source toolboxes** for the scientific exploitation of **Earth Observation missions** under the the Scientific Exploitation of Operational Missions (SEOM) programme element. **STEP** is the ESA **community platform** for accessing the software and its documentation, communicating with the developers, dialoguing within the science community, promoting results and achievements as well as providing tutorials and material for training scientists using the Toolboxes.

The ESA toolboxes support the **scientific exploitation** for the **ERS-ENVISAT** missions, the **Sentinels 1/2/3** missions and a range of **National** and **Third Party** missions. The three toolboxes are called respectively Sentinel 1, 2 and 3 Toolboxes and share a common architecture called **SNAP**. They contain some functionalities of historical toolboxes such as BEAM, NEST and Orfeo Toolbox that were developed over the last years.

→ SNAP SURVEY

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• POLInSAR 2017 WORKSHOP

ESA POLInSAR 2017 Workshop

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Colour and Light in the Ocean from Earth Observation



