→ 6th ESA ADVANCED TRAINING COURSE ON LAND REMOTE SENSING

SNAP & Sentinel-2 Practical lesson

[D5P1B]

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Overview

- Description of SeNtinel Application Platform (SNAP)
- Description of Science Toolbox Exploitation Platform (STEP)
- Explore SNAP functionalities to exploit the Sentinel-2 data
- Exercise 1: S2 data subset, reproject and export the result in KMZ
- Exercise 2: mosaic 2 S2 images
- Exercise 3: Collocation between Sentinel-2 and Landsat-8 data
- Do it by your self: mosaic S2 images, reproject and export the result in KMZ

SNAP

- The common architecture for all **Sentinel Toolboxes** and **SMOS Toolbox** is called Sentinel Application Platform (SNAP).
- SNAP architecture is ideal for Earth Observation processing and analysis due the following technological innovations: Extensibility, Portability, Modular Rich Client Platform, Generic EO Data Abstraction, Tiled Memory Management and a Graph Processing Framework.

Activity funded through SEOM element of ESA's EOEP-4 (www.seom.esa.int)

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Multi-mission Scientific Toolboxes – Development Consortia

- ARRAY SYSTEMS COMPUTING INC.
  - BROCKMANN CONSULT GMBH
  - DLR
  - oceandatalab

- ES La force de l'innovation
  - ES ROMÂNIA
  - TELESPAZIO VEGA DEUTSCHLAND A Finmeccanica / Thales Company
  - INRA SCIENCE & IMPACT
  - UCL Université catholique de Louvain

- BROCKMANN CONSULT
  - University of Reading
  - ES La force de l'innovation
  - ACRI ST
  - ARRAY SYSTEMS COMPUTING INC.

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SNAP Development History

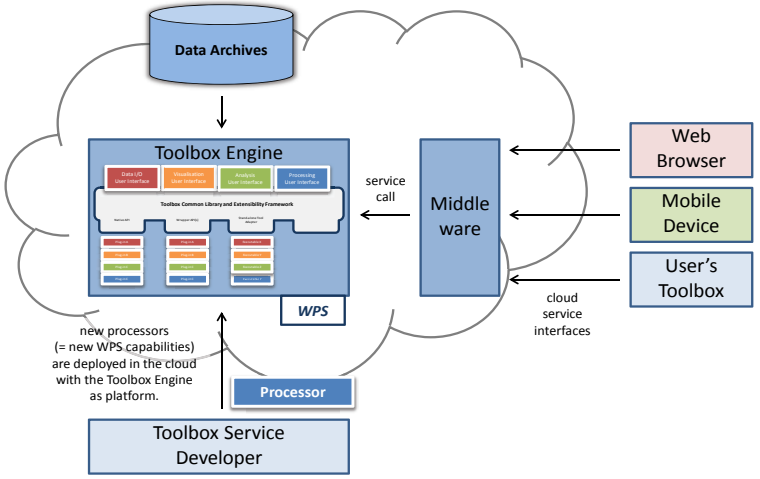
Built on prior toolbox developmen

User Developed Plugins

Benefits of SNAP

- Developed as open source software
- Common Java core framework
- Joint development plan for Sentinel toolboxes
- Interchangeable Java/Python plugins
- Portable engine to Cloud infrastructure
- Single installer

SNAP "Server Configuration"



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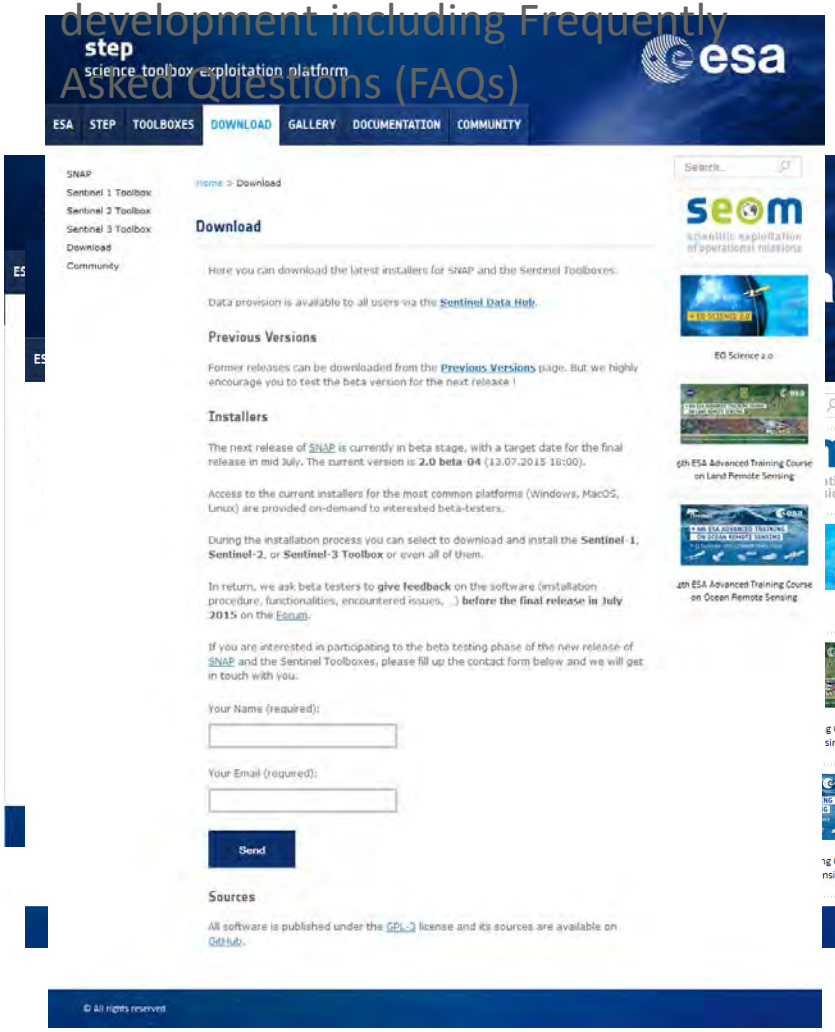
Science Toolbox Exploitation Platform

SNAP Download page

Information on Sentinel Toolboxes' Access to Beta versions for testing development including Frequently Asked Questions (FAQs)



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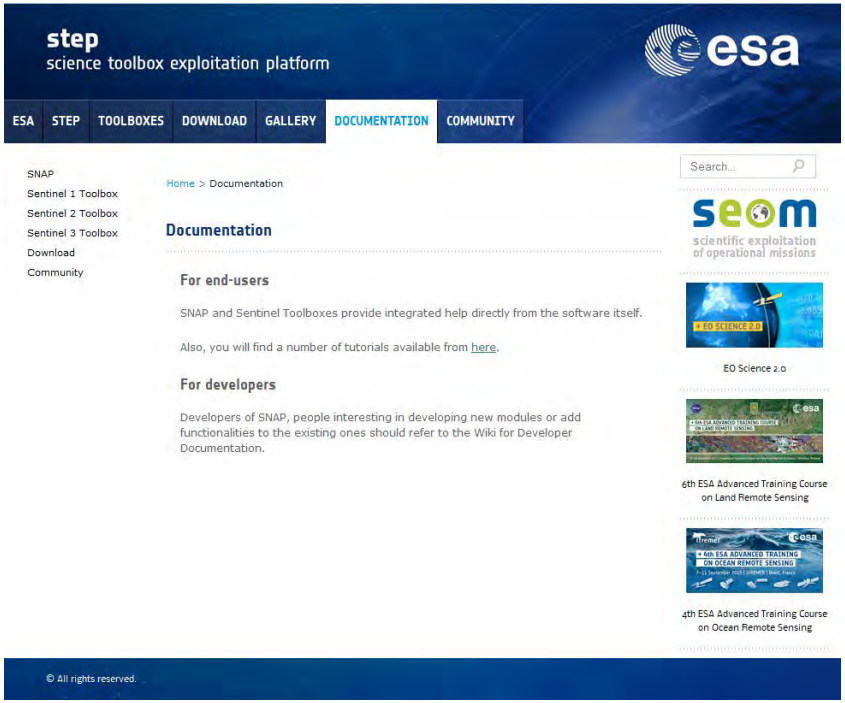
Science Toolbox Exploitation Platform

Technical documentation for both end-users and developers



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- SNAP
- Sentinel 1 Toolbox
- Sentinel 2 Toolbox
- Sentinel 3 Toolbox
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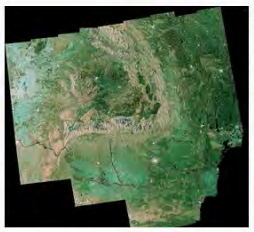
multimission scientific toolboxes

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 Features | Download | Tutorials | Community
Documentation | Developers | Gallery | Blog

The following results have been obtained thanks to the Sentinel Toolboxes :



S1A Country Mosaic of Romania

A dual polarization colour composite of entire Romania using fifteen Sentinel-1A GRDH products acquired between October and November 2014.

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Step-by-step tutorials including YouTube videos

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Home > Documentation > Tutorials > Sentinel-1 Toolbox Tutorials

Sentinel-1 Toolbox Tutorials

SAR Basics with the Sentinel-1 Toolbox

Sentinel-1 Stripmap Interferometry

Sentinel-1 TOPSAR Interferometry

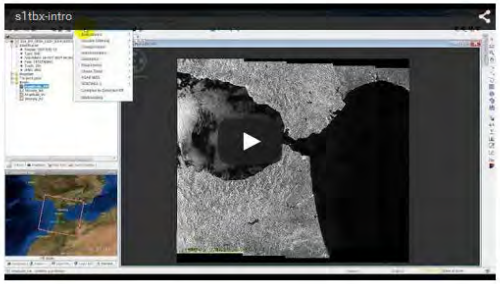
Radarsat-2 Interferometry

SAR Polarimetry

ALOS Orthorectification

Video Tutorials

S1TBX Introduction



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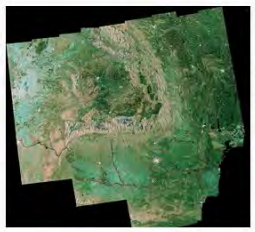

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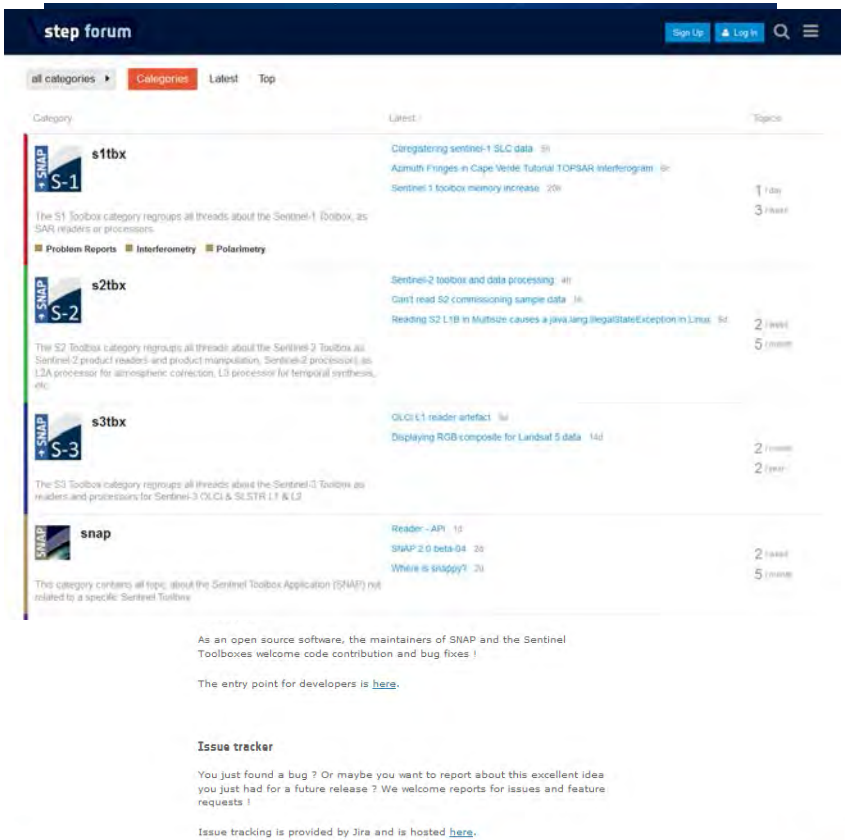
Technical forum, gathering user feedback and communicating results



EXERCISE 2

Generation Sentinel-2 Mosaic

Goals of the Exercises

- Familiarize with ESA Senintinel-2 Toolbox
- Training on the generation of RGB mosaics
- Provide instruction on step-by-step processing of Sentinel-2 data

Contains modified Copernicus Sentinel data [2015]

Input Dataset

- A set of **Sentinel-2A MSI** images acquired in August 2015

S2A_Verona

S2A_OPER_PRD_MSIL1C_PDMC_20150818T101204_R022_V20150813T102406_20150813T102406.SAFE

S2A_Venice

S2A_OPER_PRD_MSIL1C_PDMC_20150818T101440_R022_V20150813T102406_20150813T102406.SAFE

[downloadable @ https://scihub.esa.int]

EXERCISE

Generation of S2 Mosaic

EXERCISE 1 - PART 1

Step-by-step Processing with S2TBX

EXERCISE 1 - PART 2

Mosaic Operation

»

Product spectral subset
Histogram manipulation
Mosaic parameters settings

EXERCISE 3
EO data Collocation

Input Dataset

- A set of **Sentinel-2A MSI & Landsat-8** images acquired in August 2015

S2A_Venice

S2A_OPER_PRD_MSIL1C_PDMC_20150818T101440_R022_V20150813T102406_20150813T102406.SAFE

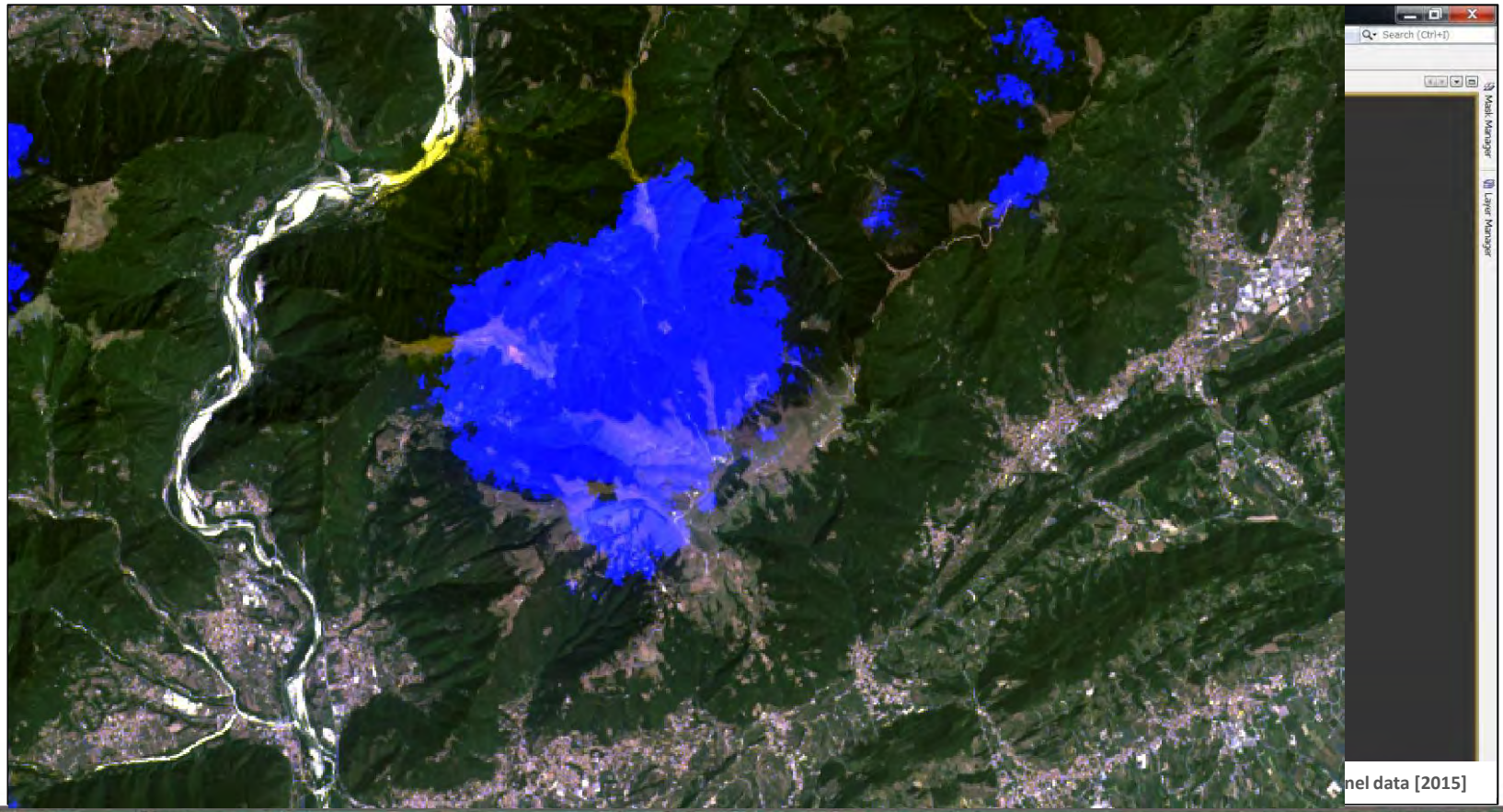
[downloadable @ https://scihub.esa.int]

LC81920282015221LGN00

[downloadable @ https://earthexplorer.usgs.gov]

Goals of the Exercise

- Emphasize the multi-mission aspect of SNAP
- Training on the generation of composite in terms of spectral bands coming from different sensors
- Provide instruction on step-by-step processing of Sentinel-2 and ESA TPM data



EXERCISE

Collocate S2 & L8 images and create a new product

PART 1

Step-by-step Processing with S2TBX

PART 2

Export in GeoTIFF

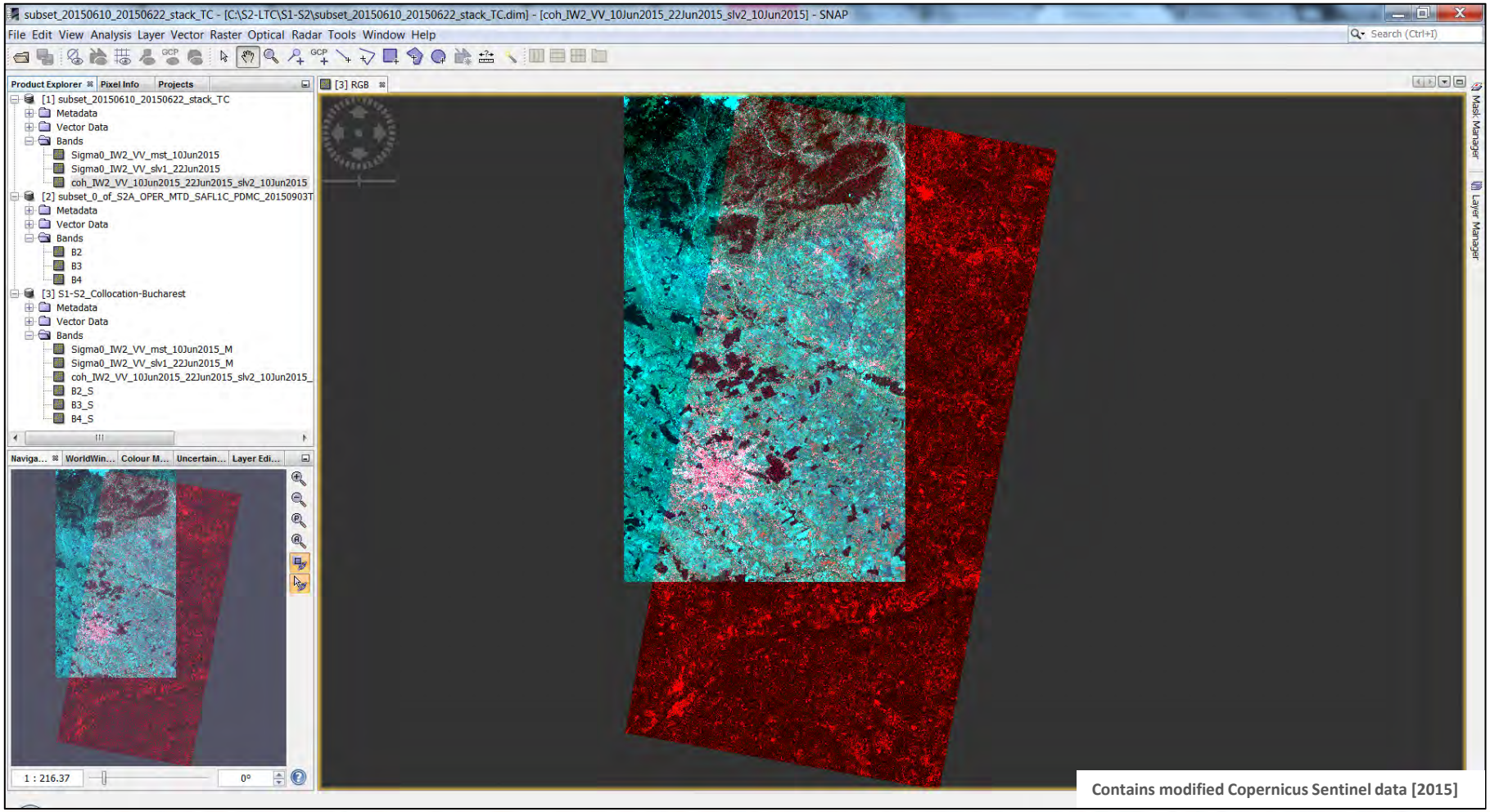
» Product spectral subset
Export data in GeoTIFF

PART 3

S2 & L8 Collocation Operation

» Collocation parameters settings
Results visualization

Collocation between S-2 and S-1 data over Bucharest



Contains modified Copernicus Sentinel data [2015]

EXERCISE

Do it by your self

Input Dataset

- A set of **Sentinel-2A MSI** images acquired in August 2015

S2A_Verona

S2A_OPER_PRD_MSIL1C_PDMC_20150818T101204_R022_V20150813T102406_20150813T102406.SAFE

S2A_Venice

S2A_OPER_PRD_MSIL1C_PDMC_20150818T101440_R022_V20150813T102406_20150813T102406.SAFE

S2A_Milan

S2A_OPER_MTD_SAFL1C_PDMC_20150818T101319_R065_V20150806T102902_20150806T102902.SAFE

[downloadable @ https://scihub.esa.int]

EXERCISE

Generation of S2 Mosaic and create a KMZ

PART 1
Step-by-step Processing with S2TBX

PART 2
Mosaic Operation

» Product spectral subset
» Histogram manipulation
» Mosaic parameters settings

PART 3
Export of Results

» Reproject the RGB Mosaic in Lat/Lon
» Export in Google Earth formats

Land Training Course – User Survey

http://step.esa.int/survey/2015-land-training