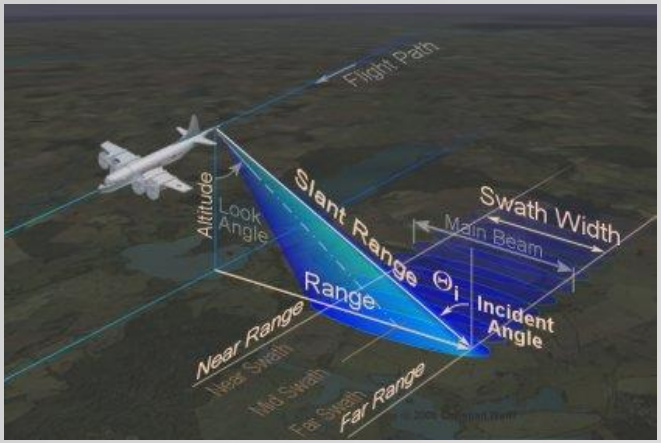
SNAP hands on: Actions before the School!!! Version 1.0

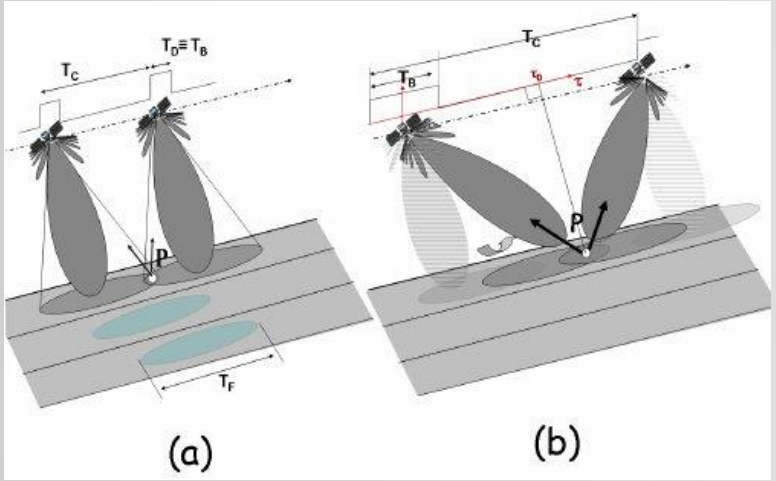
Before arrive at the CRL School 2019 prepare your linux machine :

- Download and install the software SNAP
- In order to be able to download the SENTINEL-1 data Register at Alaska SAR Facility
- Unzip, make executable (chmod u+x CRLSchool2019-download-SENTINEL-1.py) and execute the python script to download two SLC SENTINEL-1 TOPSAR acquisitions, one before and one after the earthquake of Lefkada (Greece) occurred on November 17, 2015
- Enter the credential used in the Alaska SAR Facility
- Download and unzip the steps for the graphs in SNAP in xml format
- Download the final tif files (filtered and unfiltered interferograms).
- Put all the files into your linux box in folder ~/CRL

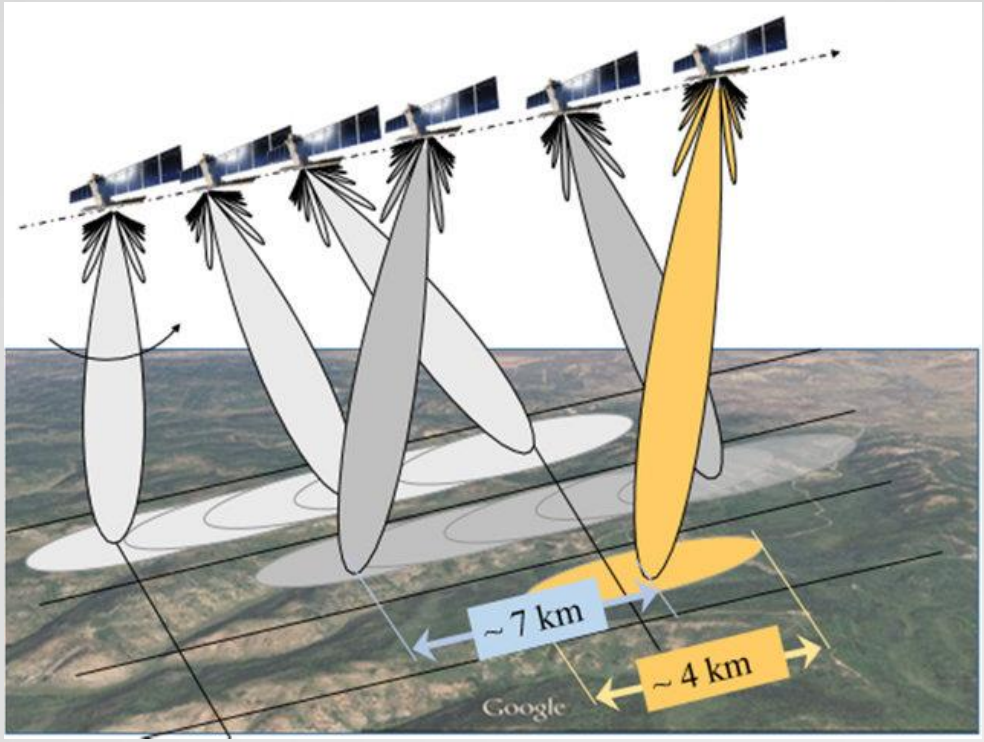
Satellite SAR Acquisition modes

STRIPMAP





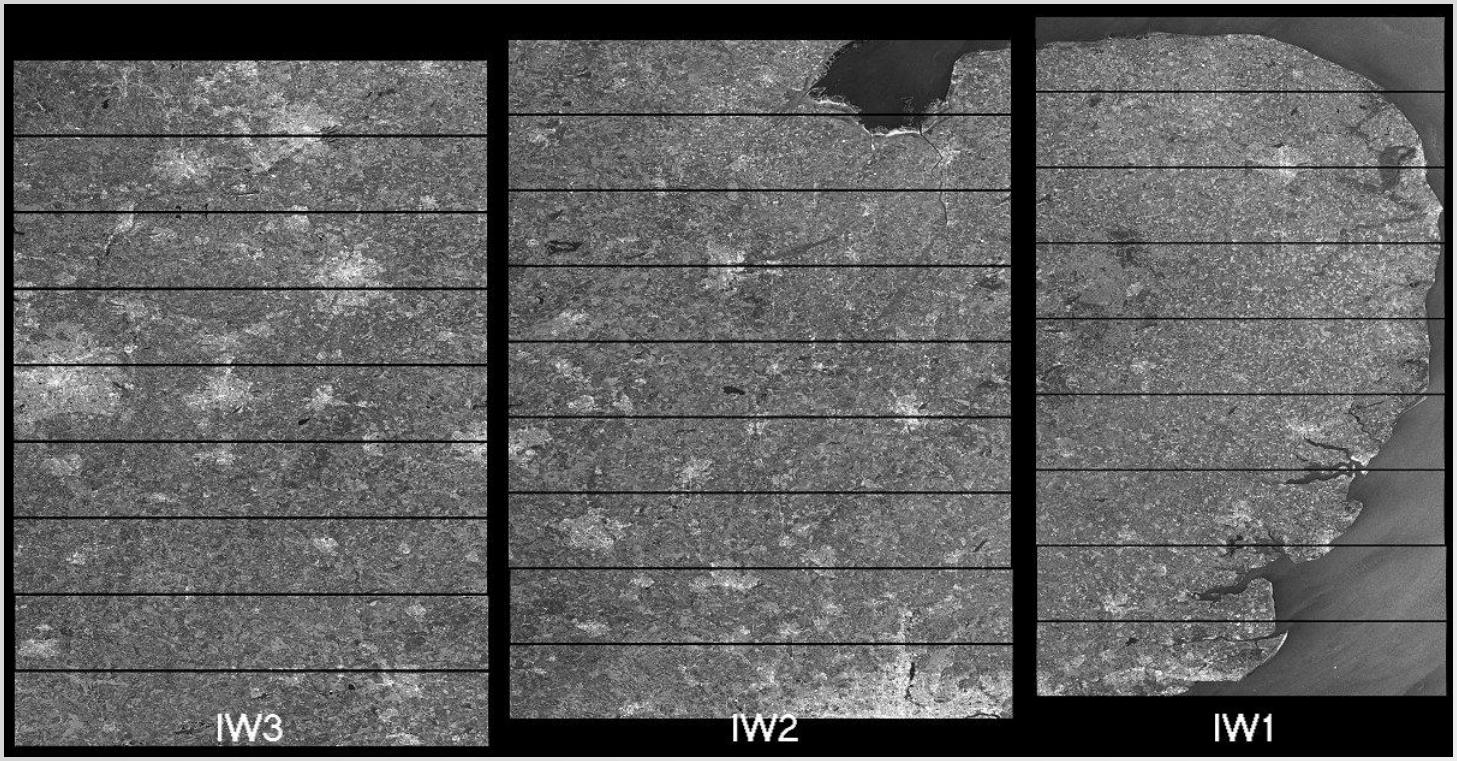
SCANSAR TOPSAR



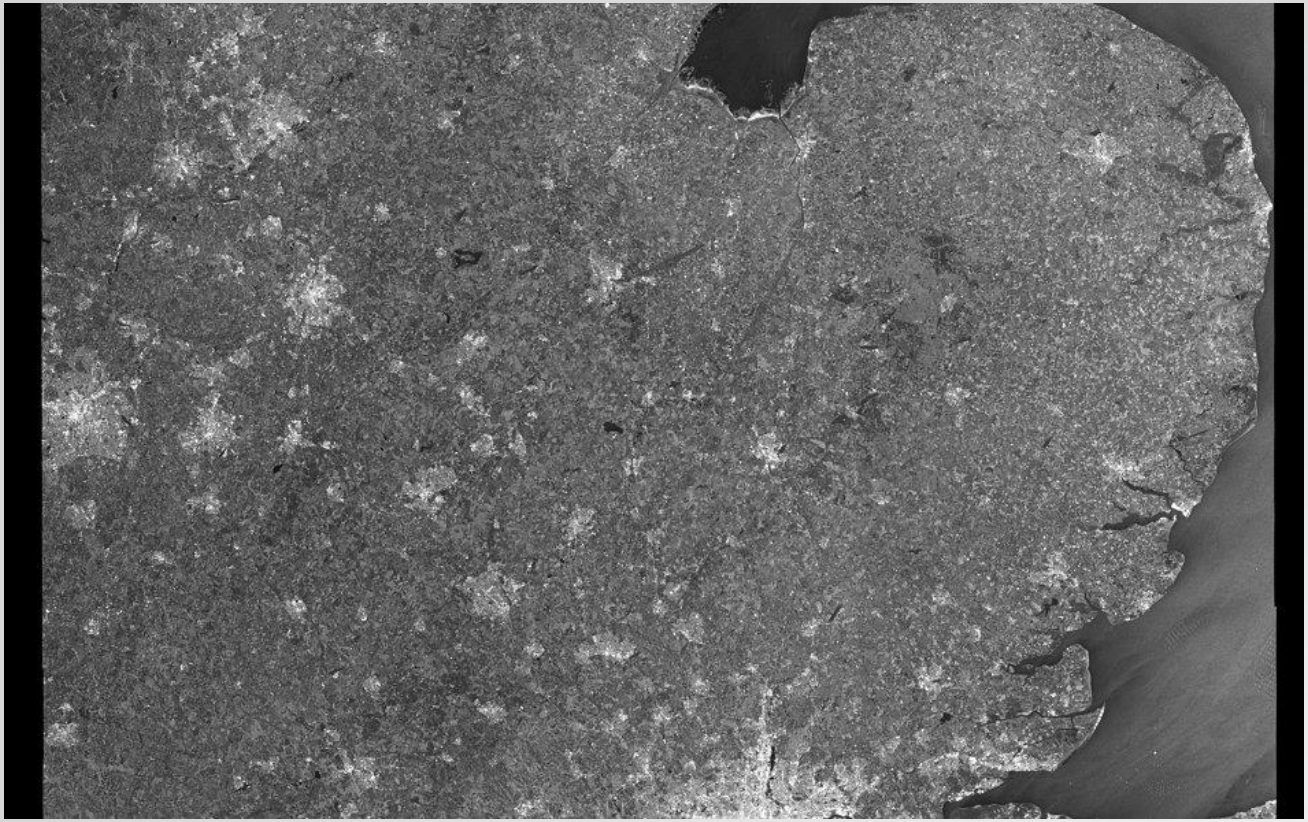
TOPSAR of SENTINEL-1
Interferometric wide swath (IW)

TOPSAR Mode of SENTINEL1

Bursts (with overlapping)



SCAN or IMAGE versus TOPSAR MODE of SENTINEL1



ESA SNAP software

- ✓ *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*

ESA SNAP software

- ✓ *Freely downloadable in* ***http://step.esa.int/main/download***
- ✓ ***"Free as in Freedom"***
- ✓ *Run it anywhere you want*
- ✓ *Make copies*
- ✓ *Distribute it*
- ✓ *Study the code*
- ✓ *Change it, Improve it, Distribute your modifications*

ESA SNAP software

SNAP, the common architecture for all Sentinel Toolboxes, is ideal for EO data processing and analysis due the following technological innovations

✓Open Source

✓Extensibility & Modularity

✓Portability

✓Multi Mission Toolbox

✓Generic EO Data Abstraction

✓Tiled Memory Management

✓Graph Processing Framework

ESA SNAP software

- *Common **architecture and data model** for all Toolboxes*
  - ✓ *Develop your own application (cli or gui)*
- *Very fast **image display and navigation** even of giga-pixel images*
  - ✓ *Advanced layer management allows adding and manipulation of new overlays such as images of other bands, images from WMS servers or ESRI shapefiles*
- ***Graph Processing Framework** (GPF)*
- ***Generic Operators***
  - ✓ *Flexible **band arithmetic** using arbitrary mathematical expressions*
  - ✓ ***Reprojection** to common map projections*
  - ✓ ***Resampling***
  - ✓ ***Subset***
- ***Supervised classification** algorithms*
  - ✓ *Random Forrest, KNN, KDTree KNN, Maximum Likelihood, Minimum Distance*
- *Automatic SRTM **DEM** download and tile selection*
- ***Multithreading** and **Multi-core** processor support*

SCAN or IMAGE versus TOPSAR MODE of SENTINEL1

Science Toolbox Exploitation Platform (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.

ESA SNAP software

A number of resources are available for end users and developers to get their hands on SNAP and the Sentinel Toolboxes.

Forum *- is maintained by the Sentinel Toolboxes project teams who will answer your questions, if not done by other community members. Collaborate, share your knowledge and learn from other users.*

Blog *- here you will find the latest news about SNAP and the Sentinel Toolboxes software.*

Stay tuned!

Developers *- As an open source software, the maintainers of SNAP and the Sentinel Toolboxes welcome code contribution and bug fixes.*

Issue Reporting *- You just found a bug? Or maybe you want to report about this excellent idea you just had for a future release? We welcome reports for issues and feature requests.*

SENTINEL-1 graph steps with SNAP hands on

S1A_IW_SLC__1SDV_20151111T043922_20151111T043950_008552_00C1E2_48F6.zip
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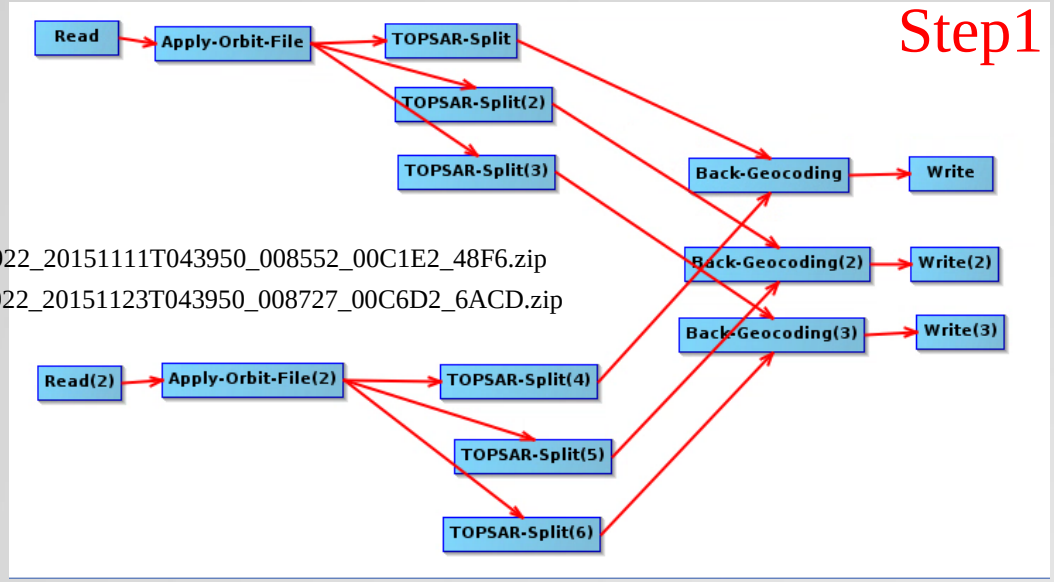


Iw1

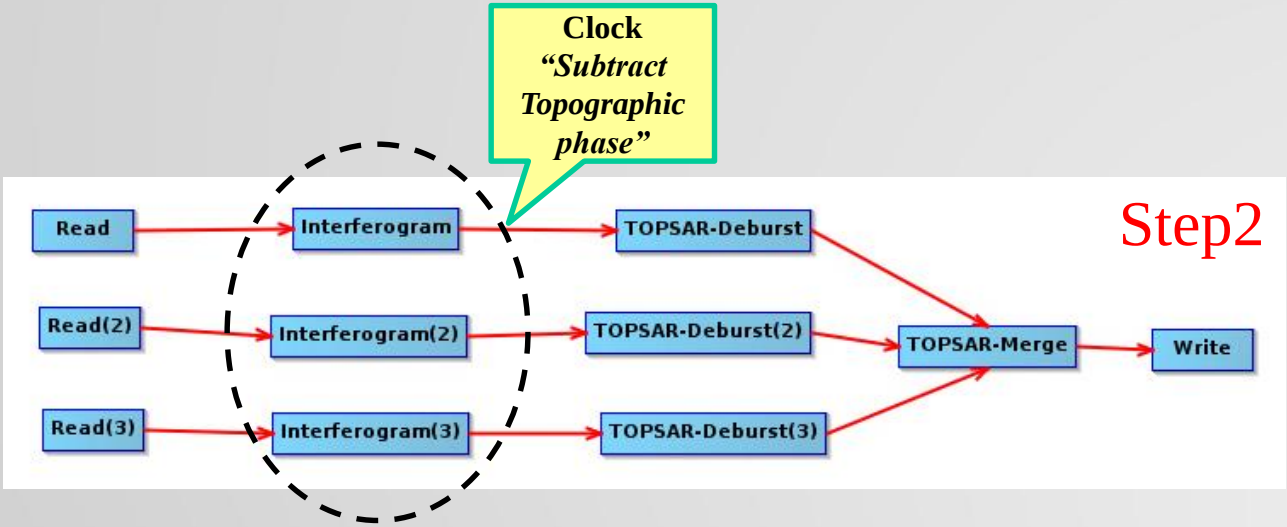
Iw2

Iw3

Iw1

Iw2

Iw3

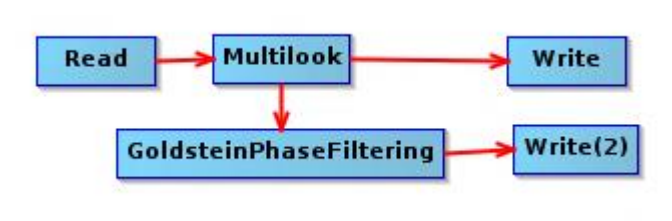


Ifg_Deb_mrg

SENTINEL-1 graph steps with SNAP hands on

Step3

Ifg_Deb_mrg



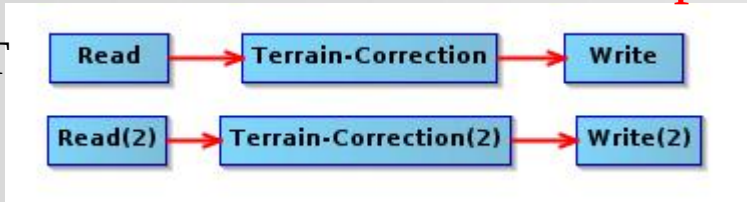
Ifg_Deb_mrg_ML

Ifg_Deb_mrg_ML_FLT

Step4

Ifg_Deb_mrg_ML_FLT

Ifg_Deb_mrg_ML



Ifg_Deb_mrg_ML_FLT_TC.tif

Ifg_Deb_mrg_ML_TC.tif