

DIAPOTB

A NEW OPEN SOURCE TOOL FOR DIFFERENTIAL SAR INTERFEROMETRY

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Philippe Durand^a, Nadine Pourthié^a, Gaëlle Usseglio^b, Céline Tison^a

^a CNES, 18 avenue E. Belin 31401 Toulouse, France

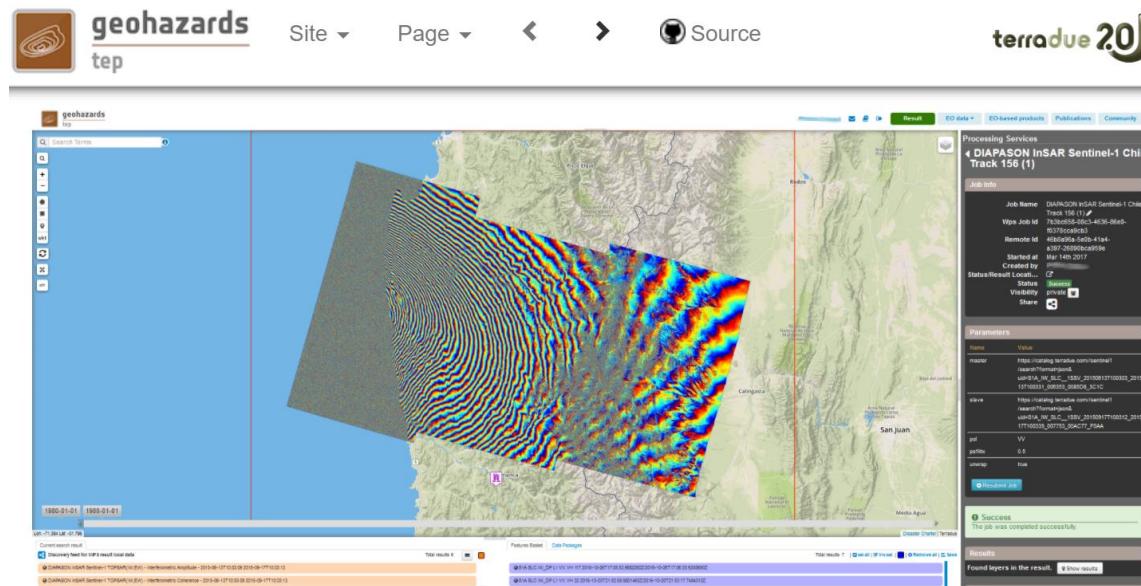
^b Thales services, allée du lac innopole zac de l'herz 31670 Labège, France





Massonnet et al. 1994

DiapOTB is based on the heritage of CNES DIAPASON s/w maintained by TRE/ALTAMIRA until 2016 and which is still running on GTEP ESA platform in a friendly interface.



It has become an **open source** s/w in the framework of the **Orfeo ToolBox (OTB)** offering new SAR modules in this open library



DIAPOTB : a remote module in the ready to use binary packages of OTB available for Windows, Linux and Mac

License: Apache License 2.0



Orfeo ToolBox
Orfeo ToolBox is not a black box

Forum Download Documentation Blog Community

Orfeo ToolBox is an open-source project for state-of-the-art remote sensing, including a fast image viewer, apps callable from Bash, Python or QGIS, and a powerful C++ API.

Open Source processing of remote sensing images

[Download OTB 7.2.0](#)
Released on 2020-10-05

[Clone with Git](#)

Orfeo ToolBox (OTB) is an [open-source](#) project for state-of-the-art remote sensing. Built on the shoulders of the open-source geospatial community, it can process high resolution optical, multispectral and radar images at the terabyte scale. A wide variety of applications are available: from ortho-rectification or pansharpening, all the way to classification, SAR processing, and [much more!](#)

All of OTB's algorithms are accessible from [Monteverdi](#), [QGIS](#), [Python](#), the [command line](#) or [C++](#). Monteverdi is an easy to use visualization tool with an emphasis on hardware accelerated rendering for high resolution imagery (optical and SAR). With it, end-users can visualize huge raw Imagery products and access all of the applications in the toolbox. From resource limited laptops to high performance MPI clusters, OTB is available on Linux, macOS and Windows. It is community driven, extensible and heavily documented. Orfeo ToolBox is not a black box!

[!\[\]\(5aad5154cab86cea48dd9d10e2d01884_img.jpg\) Start using OTB](#)

[!\[\]\(a86311389280ae0b3c35372f357d29e9_img.jpg\) OTB features](#)

[!\[\]\(8f42d78483b86945861e530255975cad_img.jpg\) Documentation](#)

[!\[\]\(287da7a09f729ff8ffbb7c8e15682c46_img.jpg\) OTB community](#)

[!\[\]\(9db2d460da95e129dad9fe6a4eb9576d_img.jpg\) Developers corner](#)

[!\[\]\(bf482075779b6420b446777065c872e5_img.jpg\) Media](#)

[!\[\]\(bbc7abdfb9431367fb12be913d461739_img.jpg\) External projects](#)

[!\[\]\(aab8472e4f9f477b9aec9ff7aa8c8dd8_img.jpg\) Blog](#)

<https://www.orfeo-toolbox.org/>

ADVANCED USE

Environment variables

Extended filenames

Compiling OTB from source

Remote Modules

Frequently Asked Questions

Contributors

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GET STARTED

Installation

Monteverdi

APPLICATIONS

Command-line interface

Graphical interface

Python API

QGIS interface

All Applications

RECIPES

From raw image to calibrated product

SAR processing

Residual registration

Image processing

Enhance local contrast

Classification

Feature extraction

Stereoscopic reconstruction

Hyperspectral image processing

Operations on images with BandMath and BandMathX



https://gitlab.orfeo-toolbox.org/remote_modules/diapotb/-/wikis/home

https://gitlab.orfeo-toolbox.org/remote_modules/diapotb/-/wikis/ProcessingChains

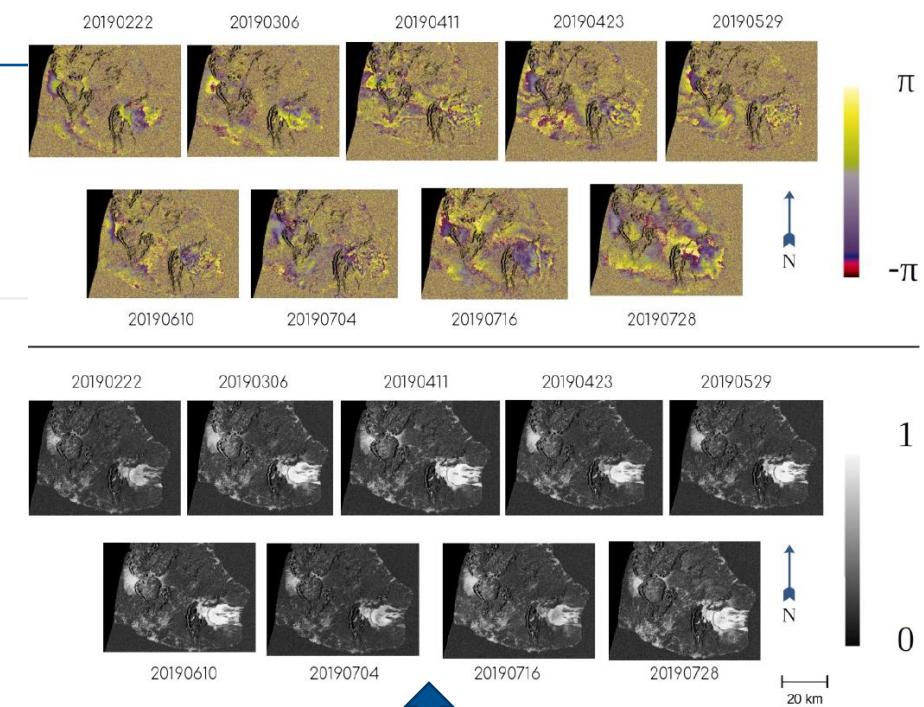
Available chains and execution

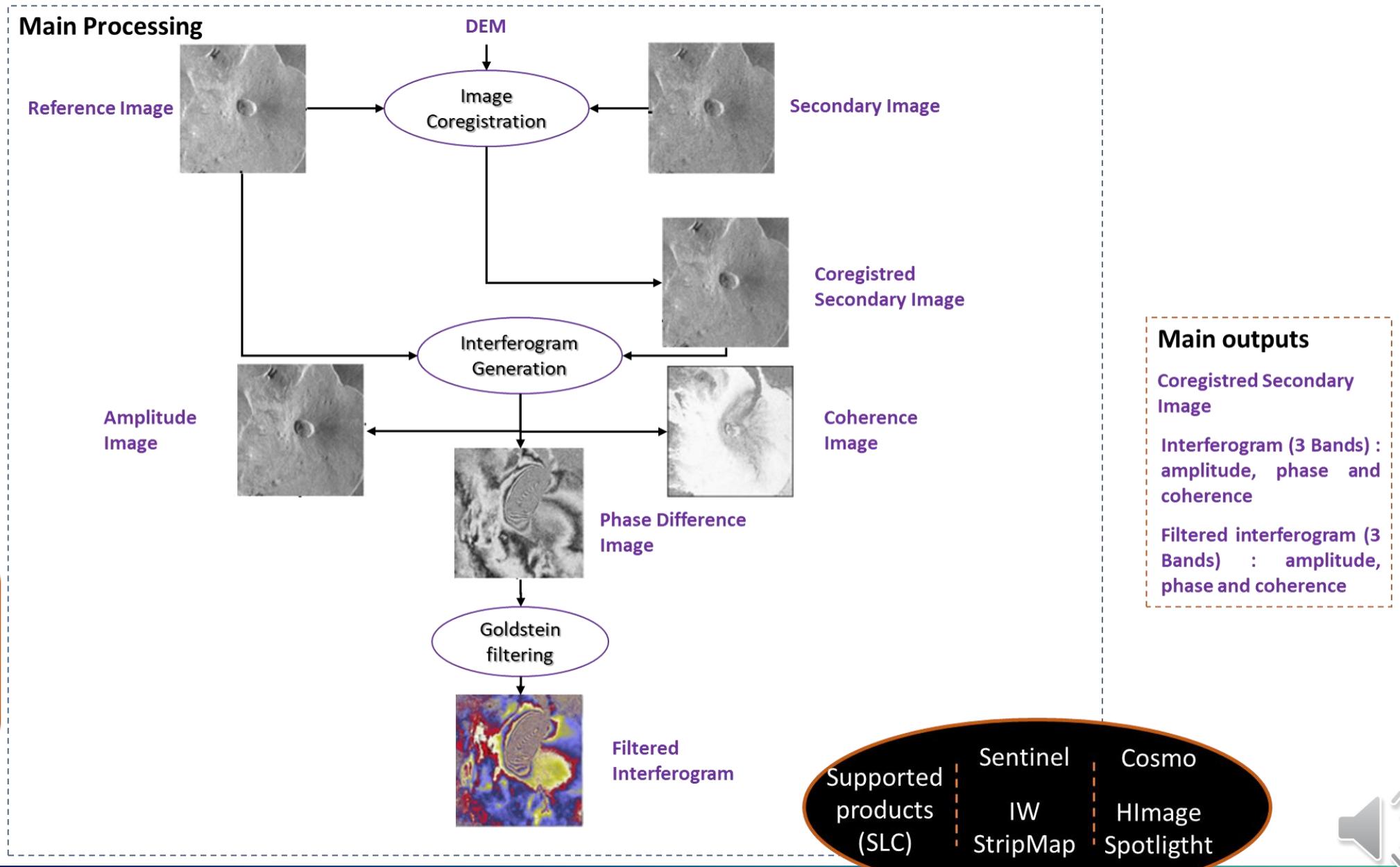
Four kinds of workflows are available according input products and modes :

- `diapOTB.py` : Single interferometry chain for S1 Stripmap mode and Cosmo
- `diapOTB_S1IW.py` : Single interferometry chain for S1 IW mode
- `SAR_MultiSlc.py` : Multitemporal interferometry chain for S1 Stripmap mode and Cosmo
- `SAR_MultiSlc_IW.py` : Multitemporal interferometry chain for S1 IW mode

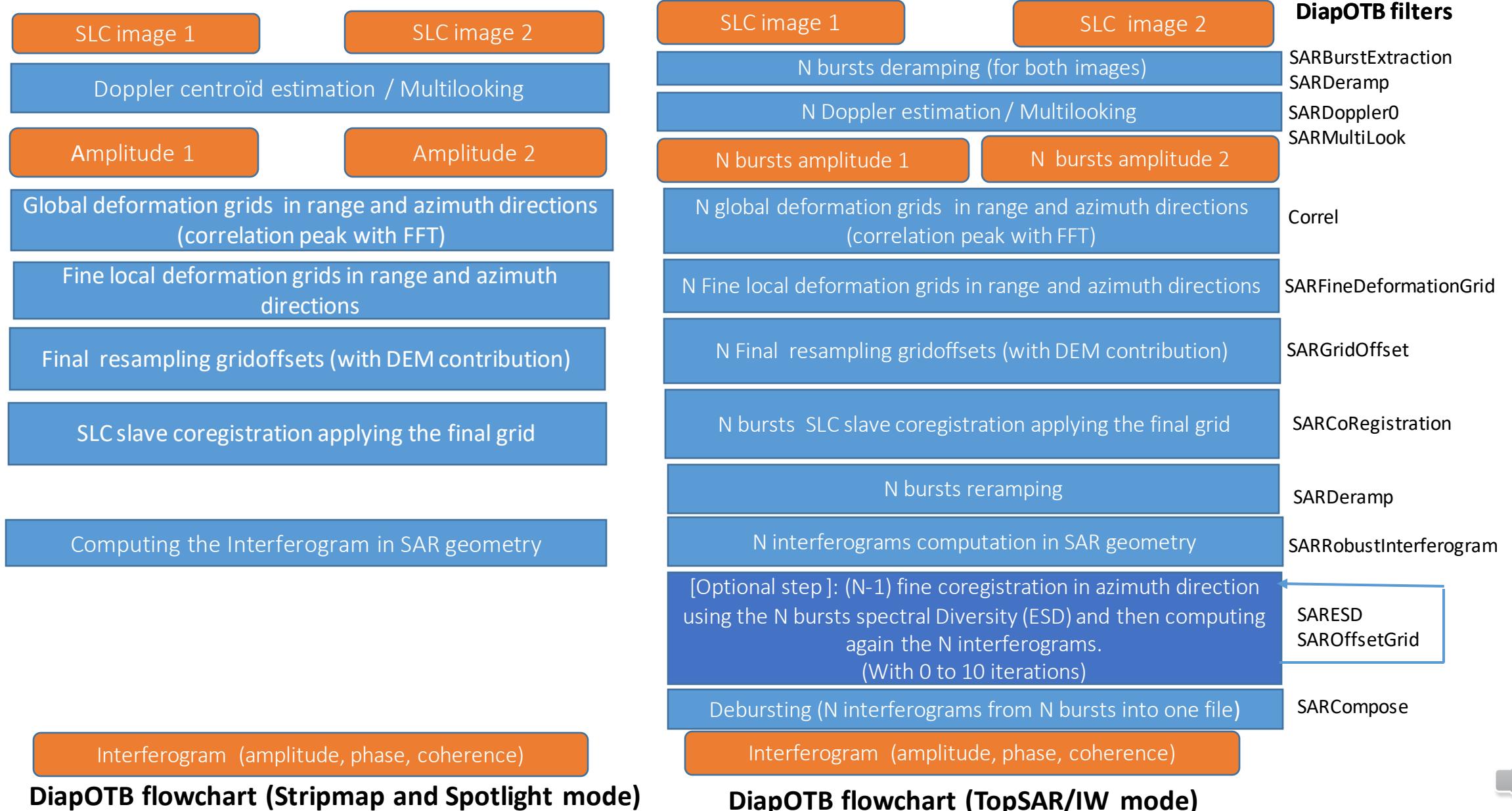
All these chains can be executed by following the [tutorial](#).

A [Python API](#) was designed to organize python scripts and to help new chain development. In case of existing workflows do not fullfill your needs, you can easily create your own workflow by calling DiapOTB applications.





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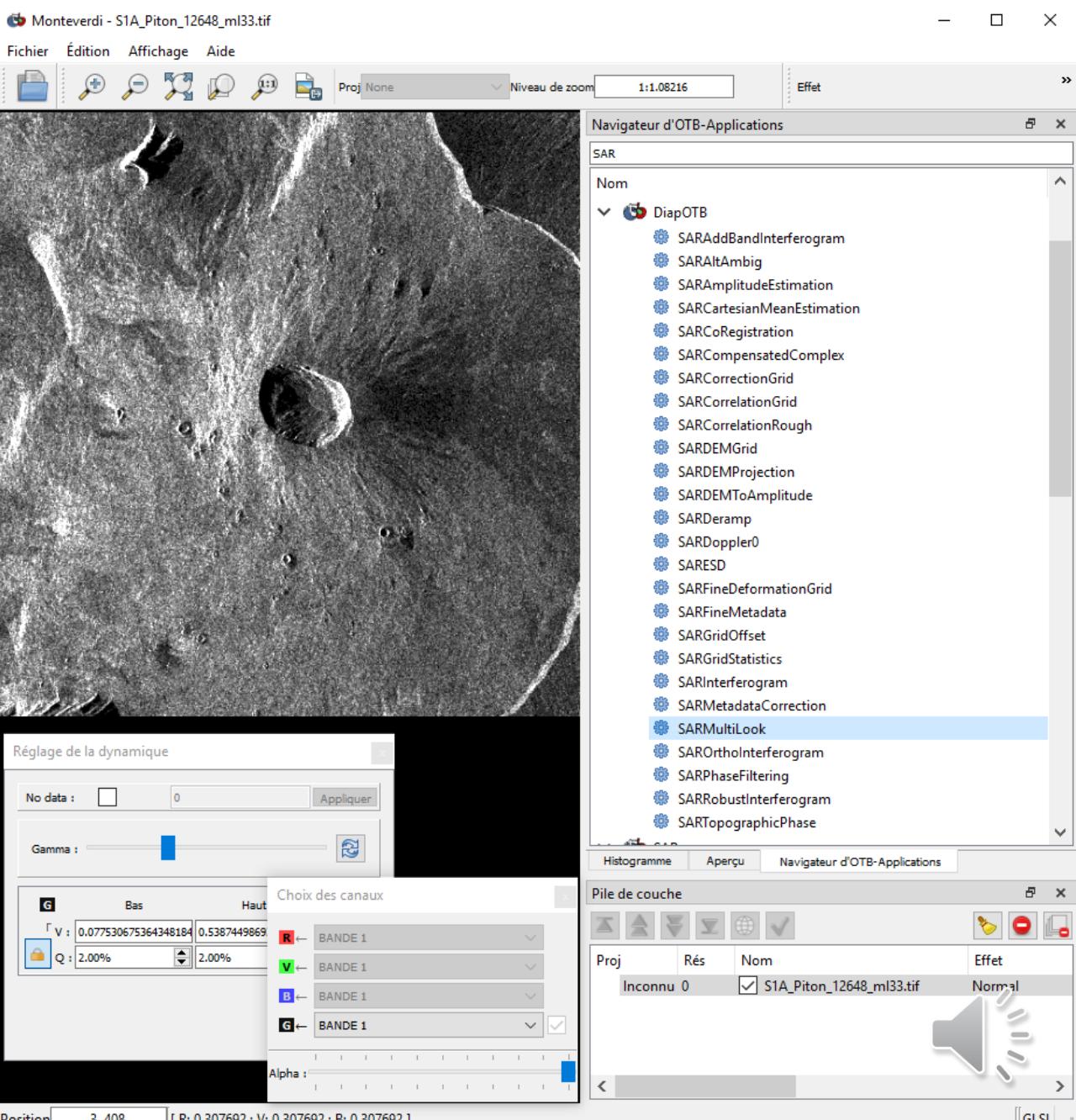
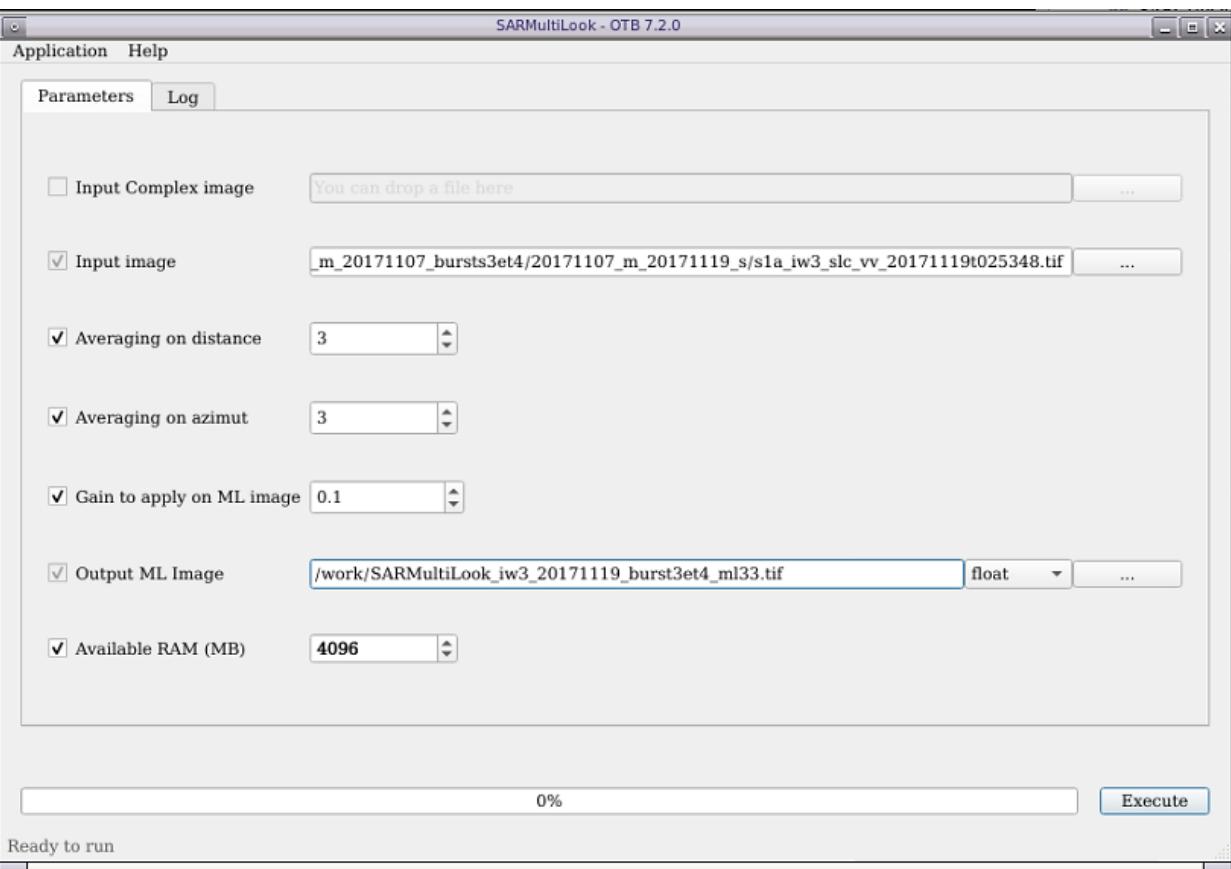


DiapOTB flowchart (Stripmap and Spotlight mode)

DiapOTB flowchart (TopSAR/IW mode)



Monteverdi user friendly graphical interface with OTB-Applications browser



Pre-processing tools, an example: Orbital Stack Analysis and Pointing Vectors

>>> use OTB command line to execute filters or applications

> otbApplicationLauncherCommandLine SARAltAmbig

This is the SARAltAmbig application, version 7.1.0 (or higher...)

Evaluation of ambiguity height

Parameters:

```
MISSING -inlist <string list> Input images list (for estimations) (mandatory)
MISSING -lat <float> Target lat (degree) (mandatory)
MISSING -lon <float> Target long (degree) (mandatory)
MISSING -height <float> Target height (m) (mandatory)
MISSING -outfile <string> Output file to store the results (mandatory)
  -bistatic <boolean> Activate bistatic Mode (optional, off by default, default value is false)
  -ram <int32> Available RAM (MB) (optional, off by default, default value is 256)
  -progress <boolean> Report progress
  -help <string list> Display long help (empty list), or help for given parameters keys
```

Use -help param1 [... paramN] to see detailed documentation of those parameters.

Outputs						
IMAGE	ORBIT	ORBIT	ORBIT	ORBIT	ORBIT	ORBIT
CSKS4_SCS_U_S2_24_HH_RA_SF_20190302045652_20190302045700	45002	45239	59740	60451	62821	45002
CSKS4_SCS_U_S2_24_HH_RA_SF_20190318045657_20190318045705						45239
CSKS2_SCS_U_S2_24_HH_RA_SF_20181224045655_20181224045703						59740
CSKS2_SCS_U_S2_24_HH_RA_SF_20190210045655_20190210045703						60451
CSKS1_SCS_U_S2_24_HH_RA_FF_20190117045656_20190117045704						62821
MASTER	SLAVE	ORBIT	Incidence	ALT AMBIG(m)	Radial	Lateral
59740	62821		51.573740	22.945	638.921	-508.054
59740	60451		51.557775	-505.847	100.894	22.975
59740	45002		51.527055	-11.148	-867.721	1044.819
59740	45239		51.558703	1488.144	195.437	-7.913
62821	60451		51.573047	-21.949	-538.312	531.385
62821	45002		51.542327	-7.503	-1507.481	1553.917
62821	45239		51.573975	-23.304	-443.751	500.477
60451	45002		51.526362	-11.400	-968.597	1021.953
60451	45239		51.558010	377.521	94.544	-30.891
45002	45239		51.527290	11.066	1062.003	-1051.770
Ground target --> Satellite Vectors :						
Image	Orbit	North Projection	East Projection	Vertical Projection		
45002		-0.209066	-0.753631	0.623163		
45239		-0.209359	-0.754264	0.622298		
59740		-0.209265	-0.754285	0.622305		
60451		-0.209330	-0.754251	0.622324		
62821		-0.209444	-0.754579	0.621887		



Conclusions and perspectives

DiapOTB within open source Orfeo ToolBox is able to produce **interferograms** as well as **stacks of coregistered SLCs data** with an automated ingestion of external DEMs in a short time.

Effort has been put so far on 2 missions :

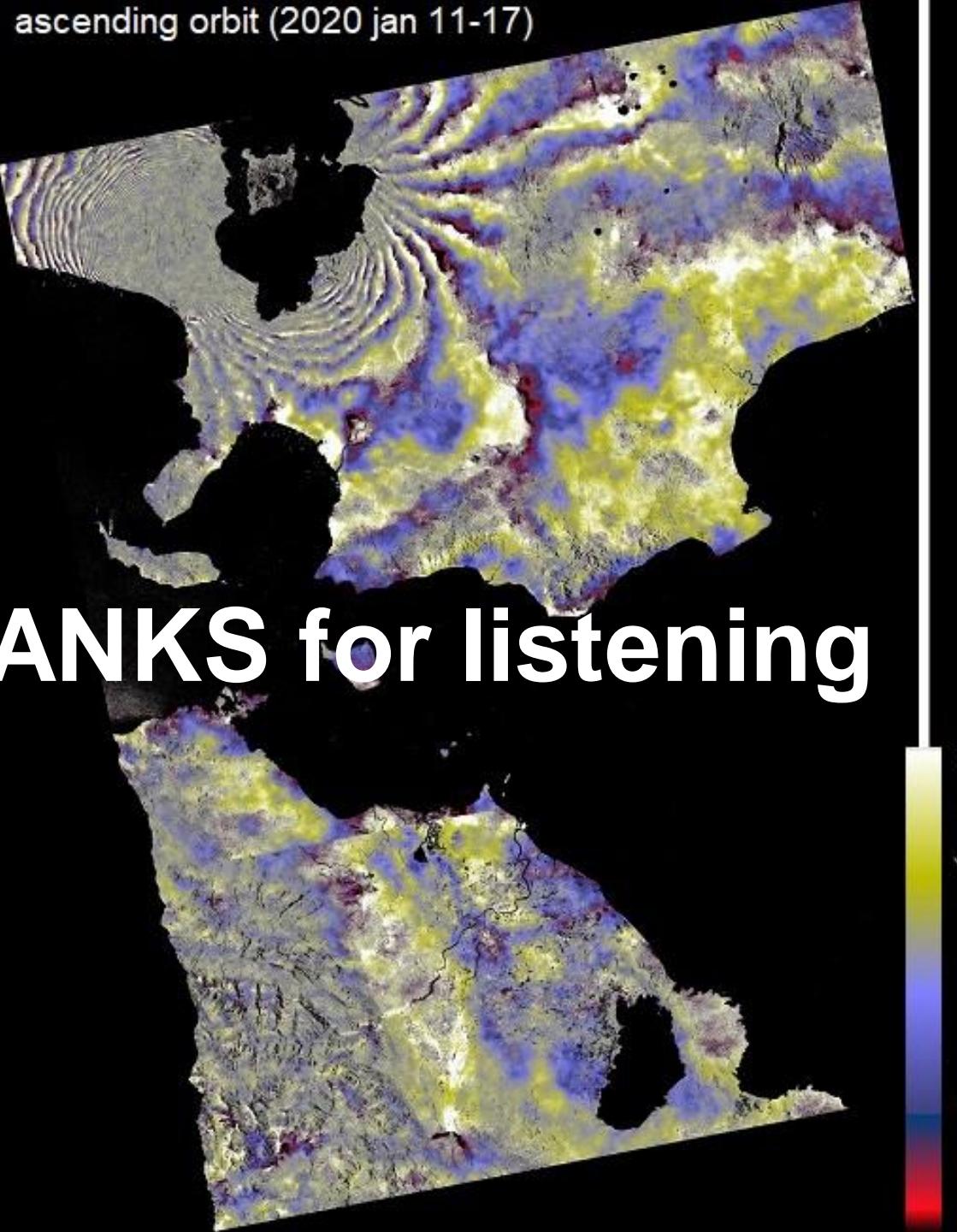
- Sentinel1: Stripmap and IW modes
- Cosmo: Stripmap and Spotlight modes

Next step in 2021 is to integrate TerraSAR-X/PAZ spotlight and stripmap modes
(we will welcome data from PAZ to test our software).

DiapOTB is an open source software and
contributions from SAR community are welcome through OTB !!

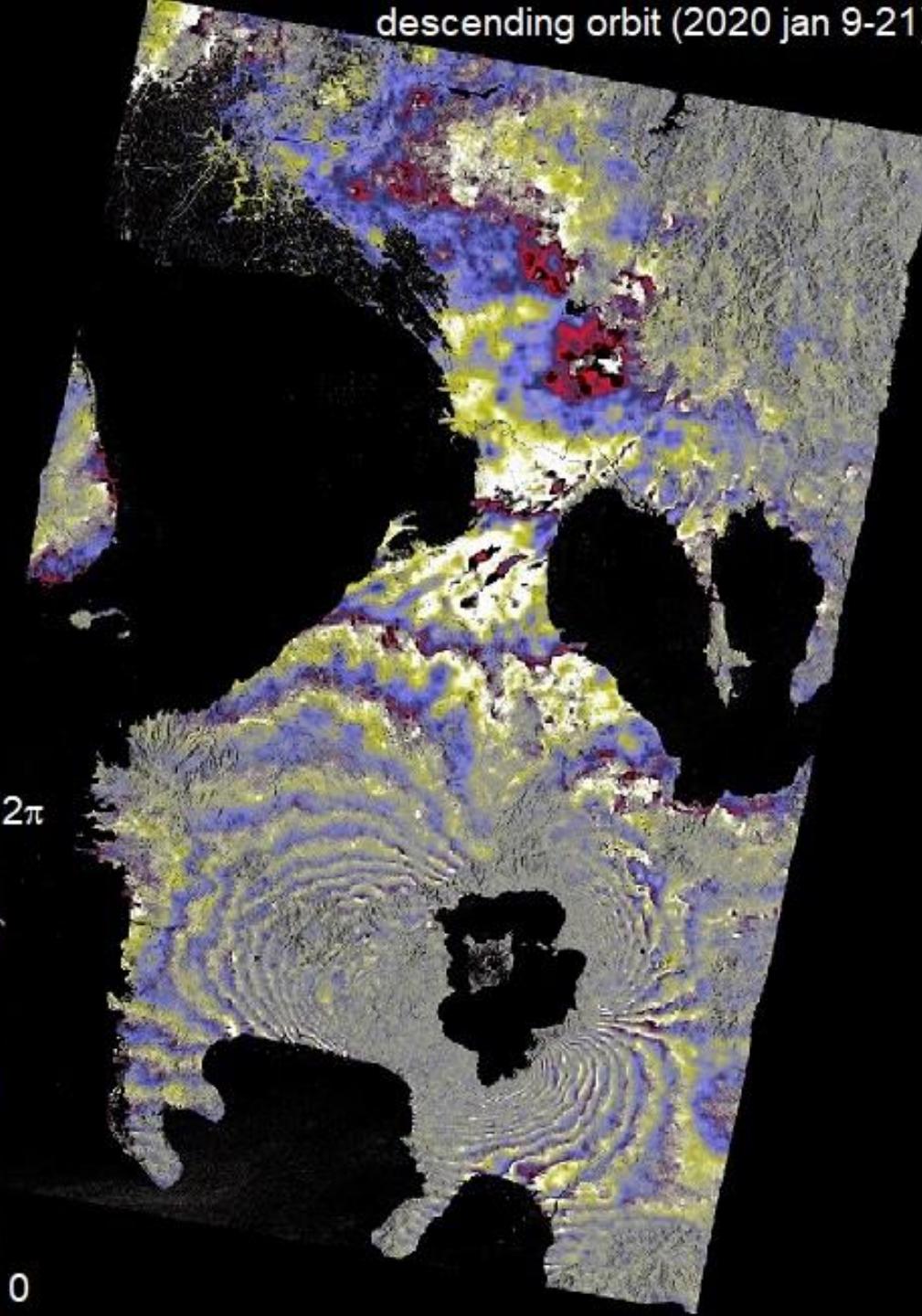


ascending orbit (2020 jan 11-17)



THANKS for listening

descending orbit (2020 jan 9-21)



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