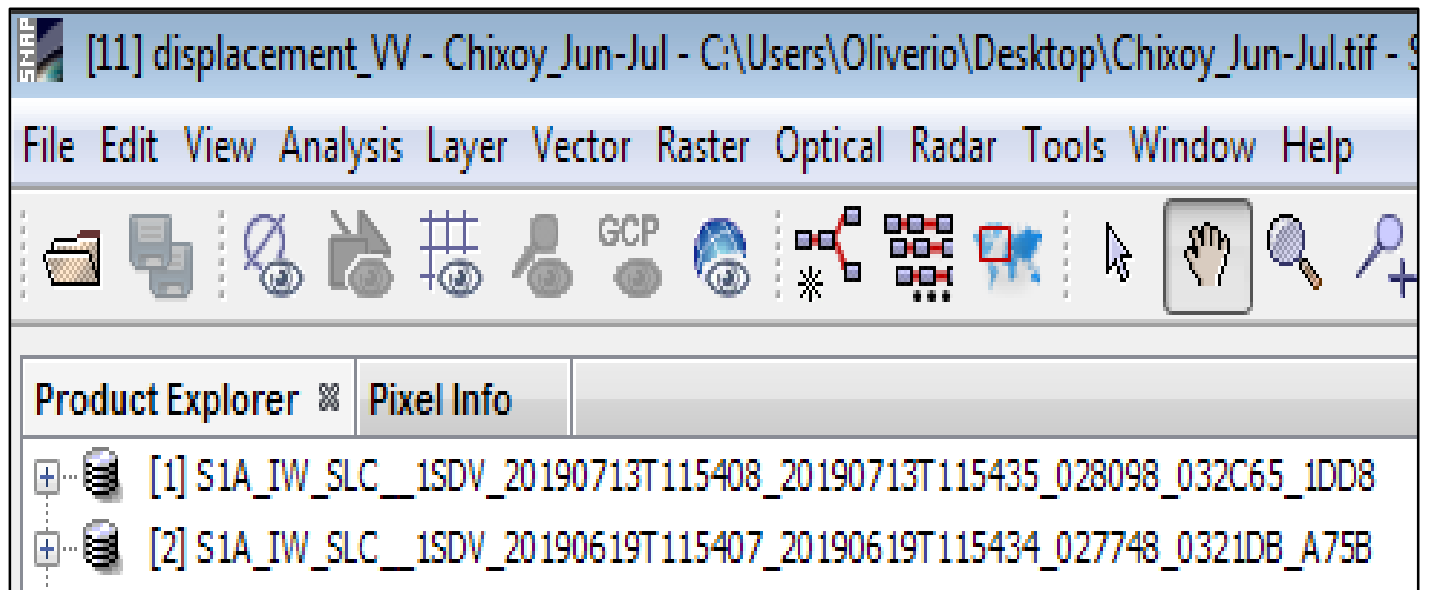
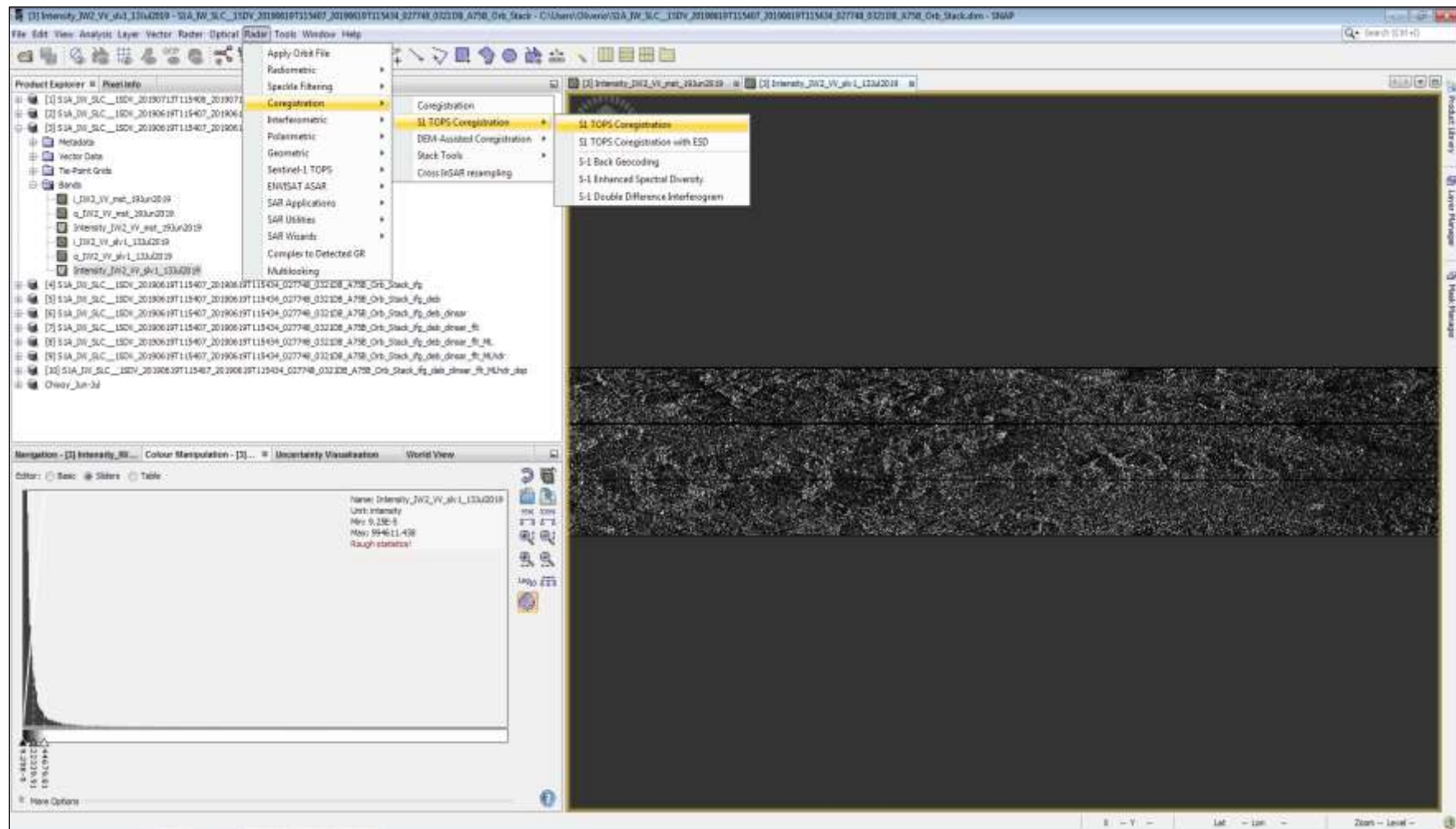


## Creation of interferogram

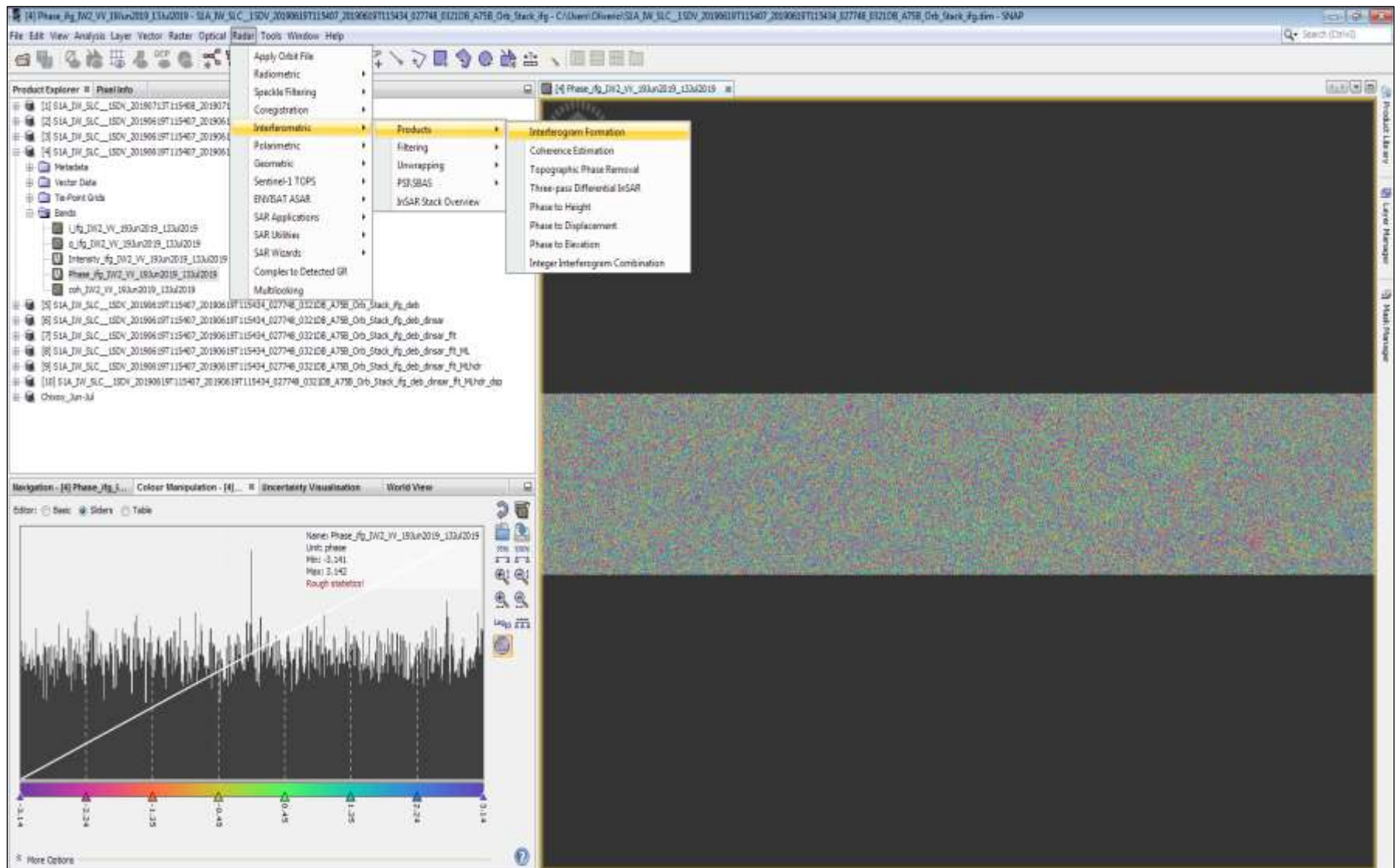
Step 1. Open data.



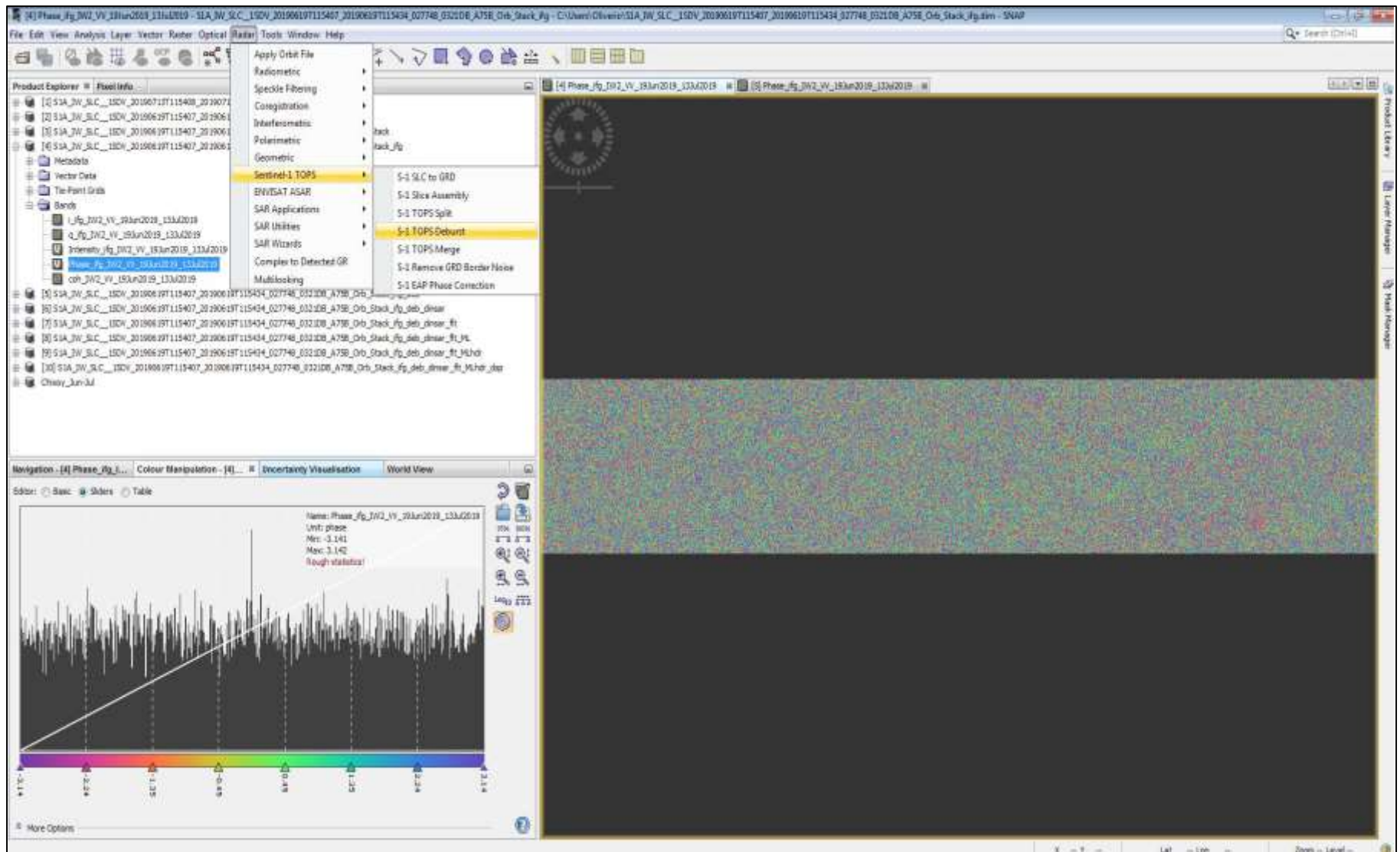
## Step 2. Coregistration



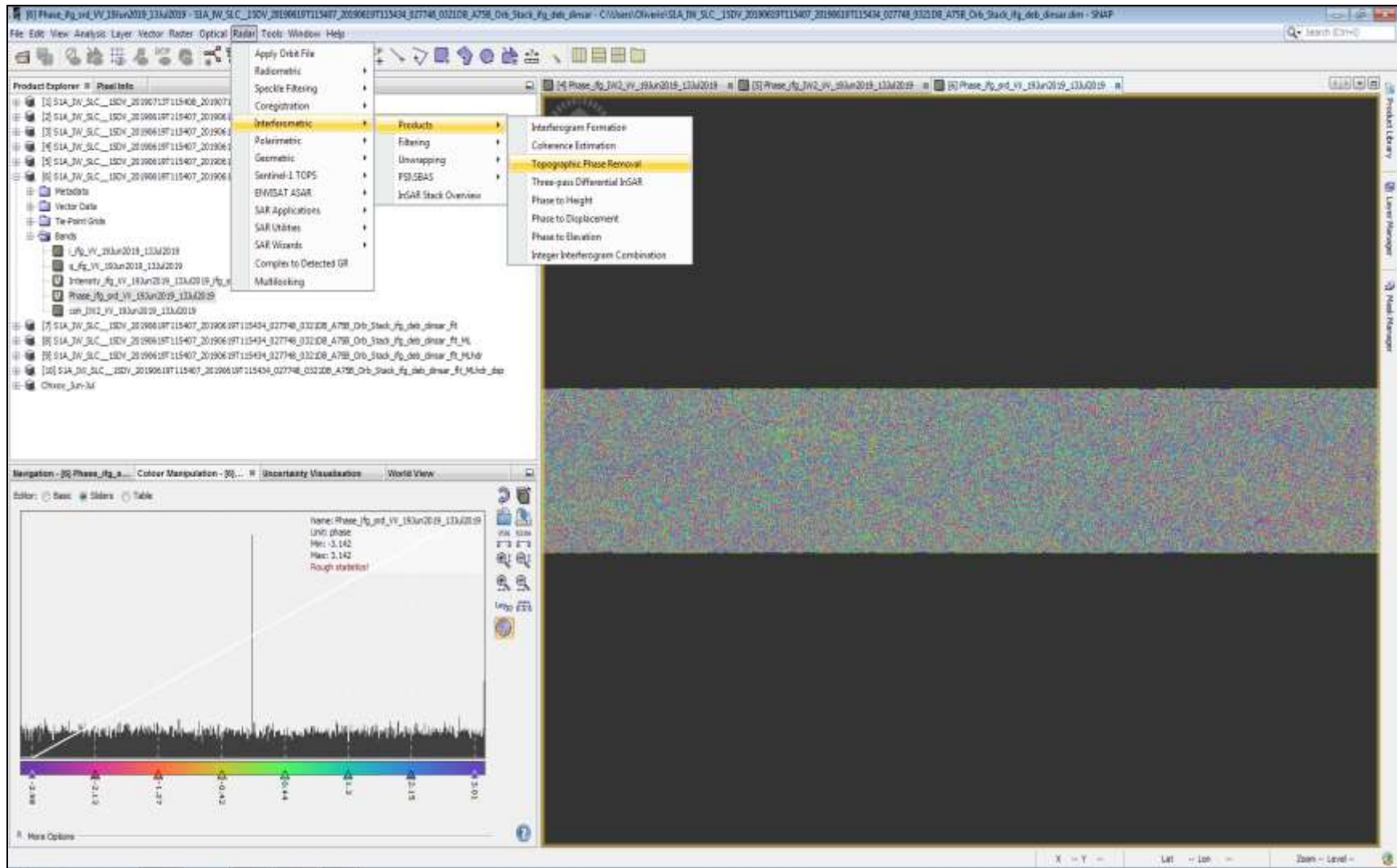
### Step 3. Interferogram formation



#### Step 4. Tops derbust

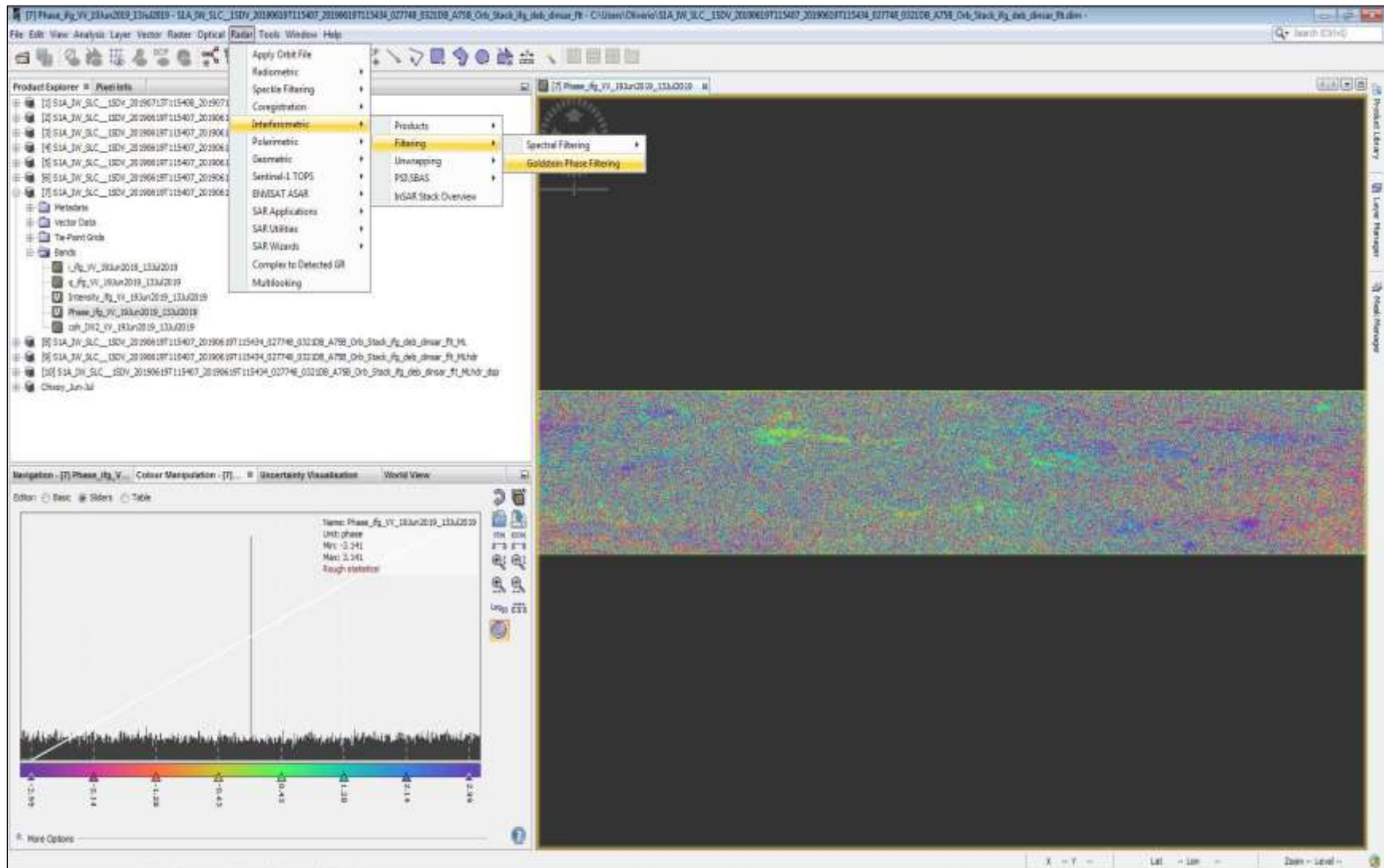


## Step 5. Topographic phase removal

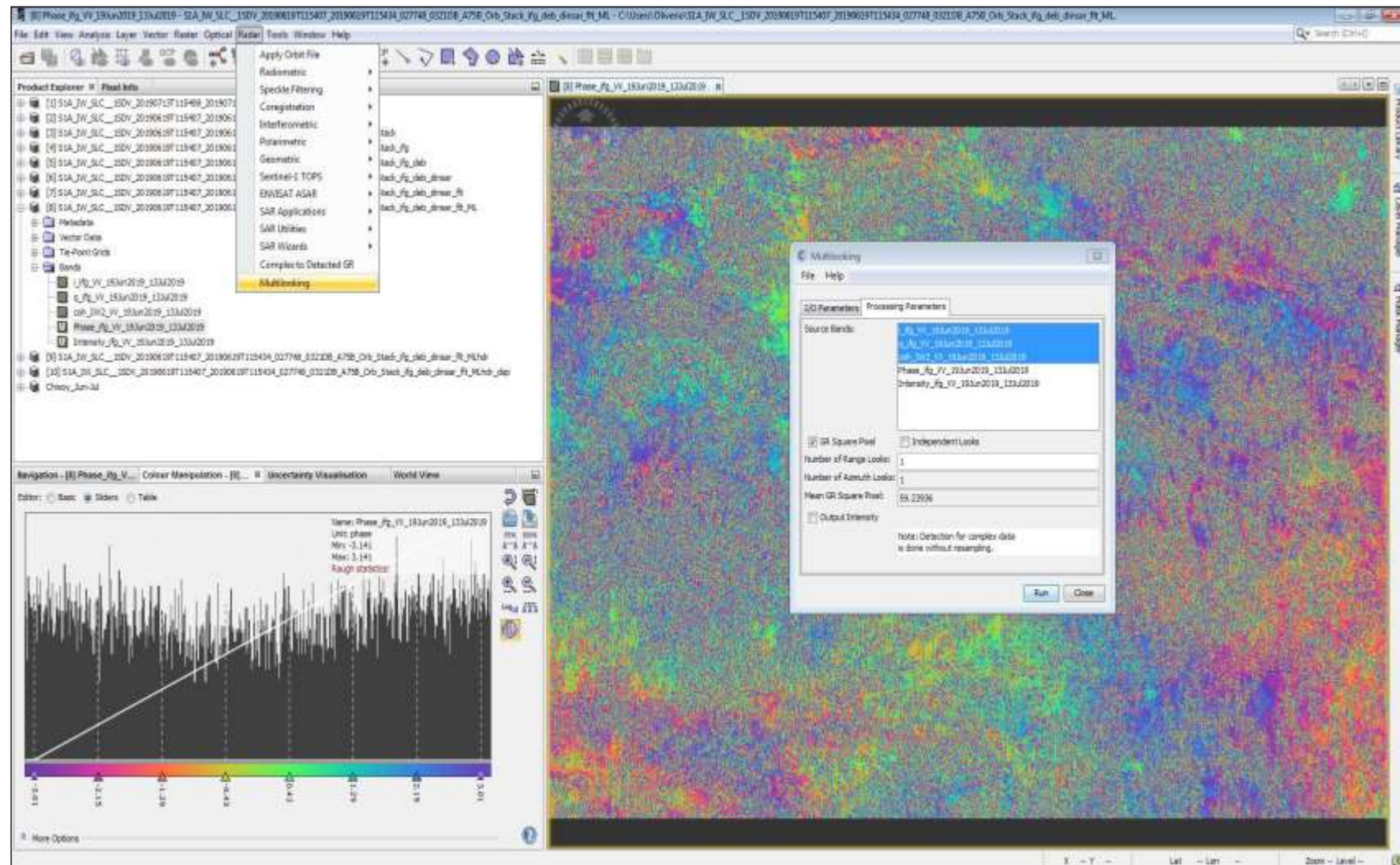




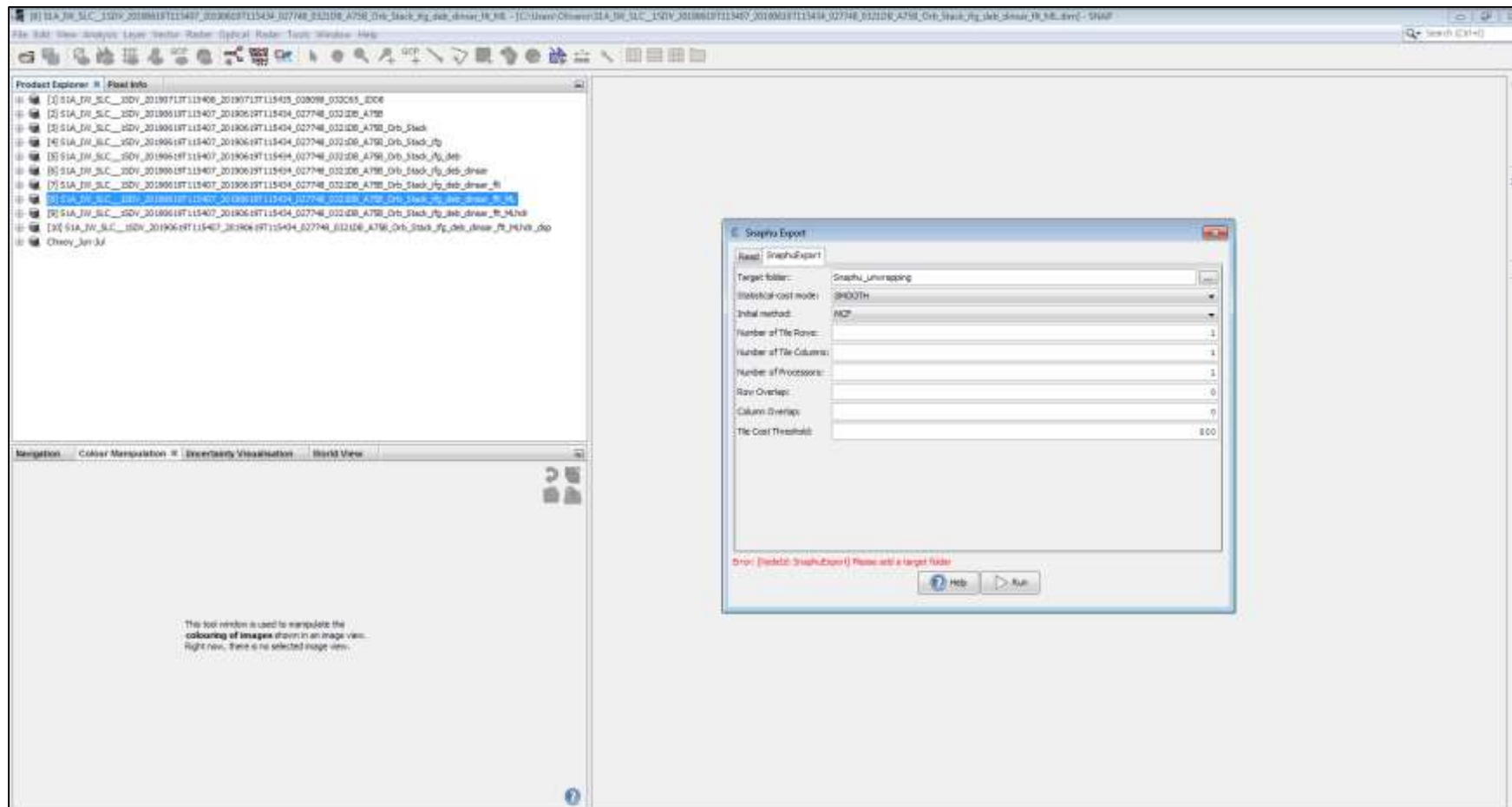
## Step 6. Goldstein phase filtering



### Step 7. Multilooking

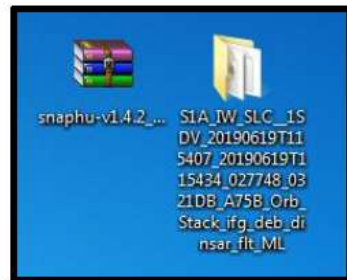


## Step 8. Snaphu export





## Step 9. Unwrapping phase with SNAPHU



In decompress the Snaphu file on the local disk, and then open the bin folder, once opened, the files exported from the Multilooking are pasted.

Once all the files are located in the bin folder, the CMD command is applied on the path to use the SNAPHU file

```
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

F:\snaphu\snaphu-v1.4.2\snaphu-v1.4.2\bin>snaphu

snaphu v1.4.2
usage: snaphu [options] infile linelength [options]
most common options:
  -t          use topography mode costs (default)
  -d          use deformation mode costs
  -s          use smooth-solution mode costs
  -f <filename> read configuration parameters from file
  -o <filename> write output to file
  -u <filename> read amplitude data from file
  -c <filename> read correlation data from file
  -b <decimal> perpendicular baseline (meters)
  -i          do initialization and exit
  -l <filename> log runtime parameters to file
  -v          give verbose output
  --mst       use MST algorithm for initialization (default)
  --mcf       use MCF algorithm for initialization

type snaphu -h for a complete list of options

F:\snaphu\snaphu-v1.4.2\snaphu-v1.4.2\bin>
```

Subsequently, the snaphu.conf file is opened and the paragraph is copied as the next step to develop the phase.

```
# CONFIG FOR SNAPHU
# -----
#
# Created by SNAP software on: 22:54:37 25/02/2018.
#
# Command to call snaphu:
#
# snaphu -f snaphu.conf Phase_ifg_VV_30Oct2017_
23Nov2017.snaphu.img 3581
#####
# Unwrapping parameters #
#####

STATCOSTMODE      DEFO
INITMETHOD        MCF
VERBOSE           TRUE

#####
# Input files #
#####

CORRFILE           coh_IM2_VV_30Oct2017_23Nov2017.snaphu.img











#####
# Output files #
#####

OUTFILE            UnwPhase_ifg_VV_30Oct2017_23Nov2017.snaphu.img
LOGFILE            snaphu.log

#####
# File formats #
#####

INFILEFORMAT       FLOAT_DATA
CORRFILEFORMAT     FLOAT_DATA
OUTFILEFORMAT      FLOAT_DATA
```

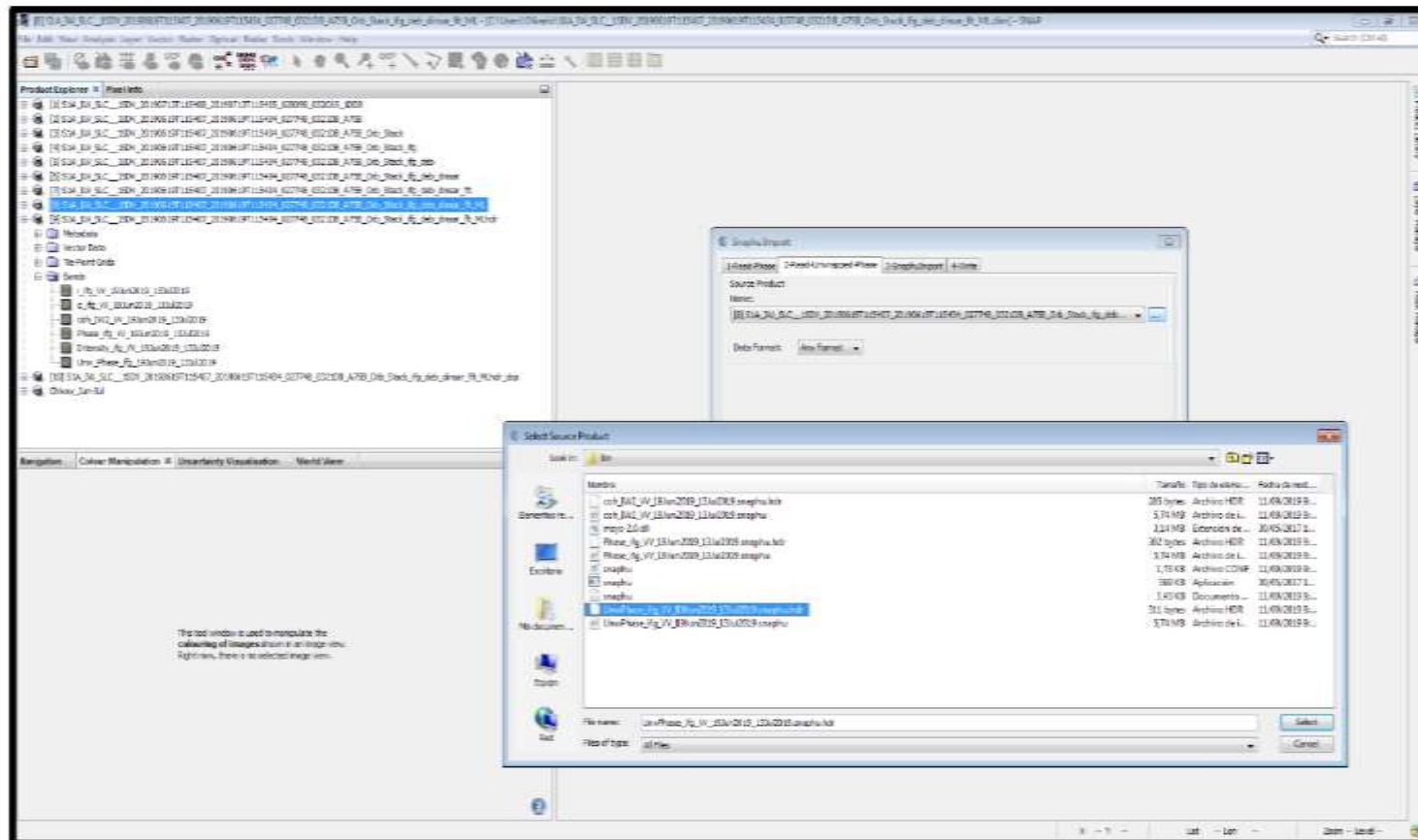
The result of the snaphu process generates two files, the first with terminal hdr and the second as img.

	coh_IW2_VV_19Jun2019_13Jul2019.snaph...	11/09/2019 9:32	Archivo HDR	1 KB
	coh_IW2_VV_19Jun2019_13Jul2019.snaphu	11/09/2019 9:32	Archivo de image...	5.884 KB
	msys-2.0.dll	30/05/2017 10:21	Extensión de la apl...	3.226 KB
	Phase_ifg_VV_19Jun2019_13Jul2019.snap...	11/09/2019 9:32	Archivo HDR	1 KB
	Phase_ifg_VV_19Jun2019_13Jul2019.snaphu	11/09/2019 9:32	Archivo de image...	5.884 KB
	snaphu	11/09/2019 9:32	Archivo CONF	2 KB
	snaphu	30/05/2017 10:19	Aplicación	370 KB
	snaphu	11/09/2019 9:39	Documento de tex...	4 KB
	UnwPhase_ifg_VV_19Jun2019_13Jul2019.s...	11/09/2019 9:32	Archivo HDR	1 KB
	UnwPhase_ifg_VV_19Jun2019_13Jul2019.s...	11/09/2019 9:41	Archivo de image...	5.884 KB

Step 10.

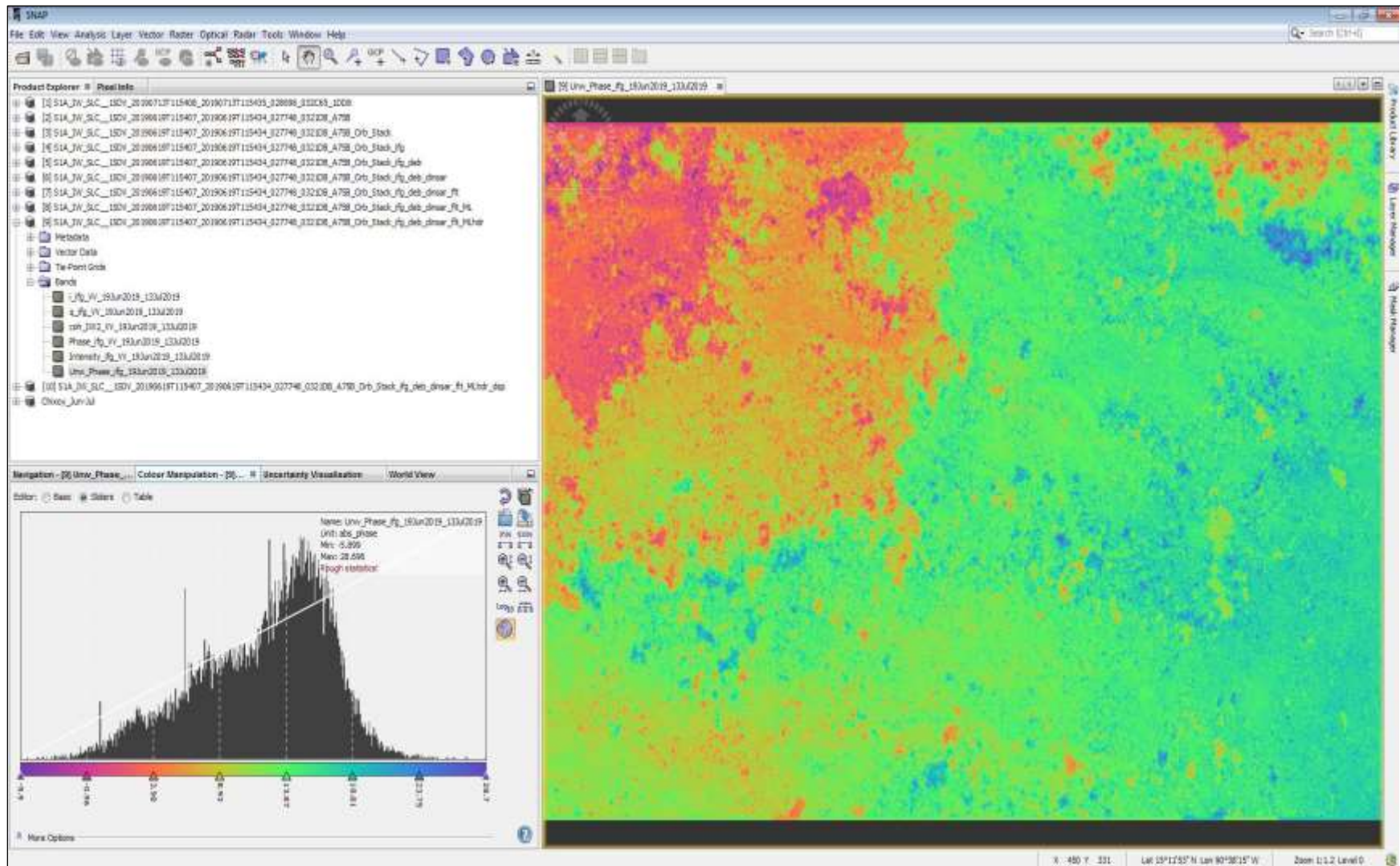
In the following link the following are placed: to.

- Read phase: the exported ML file.
- In Read Unwrapped: the UnwPhase\_ifg\_VV\_19Jun2019\_13Jul2019.snaphu.hdr file is placed and the snap program is run.

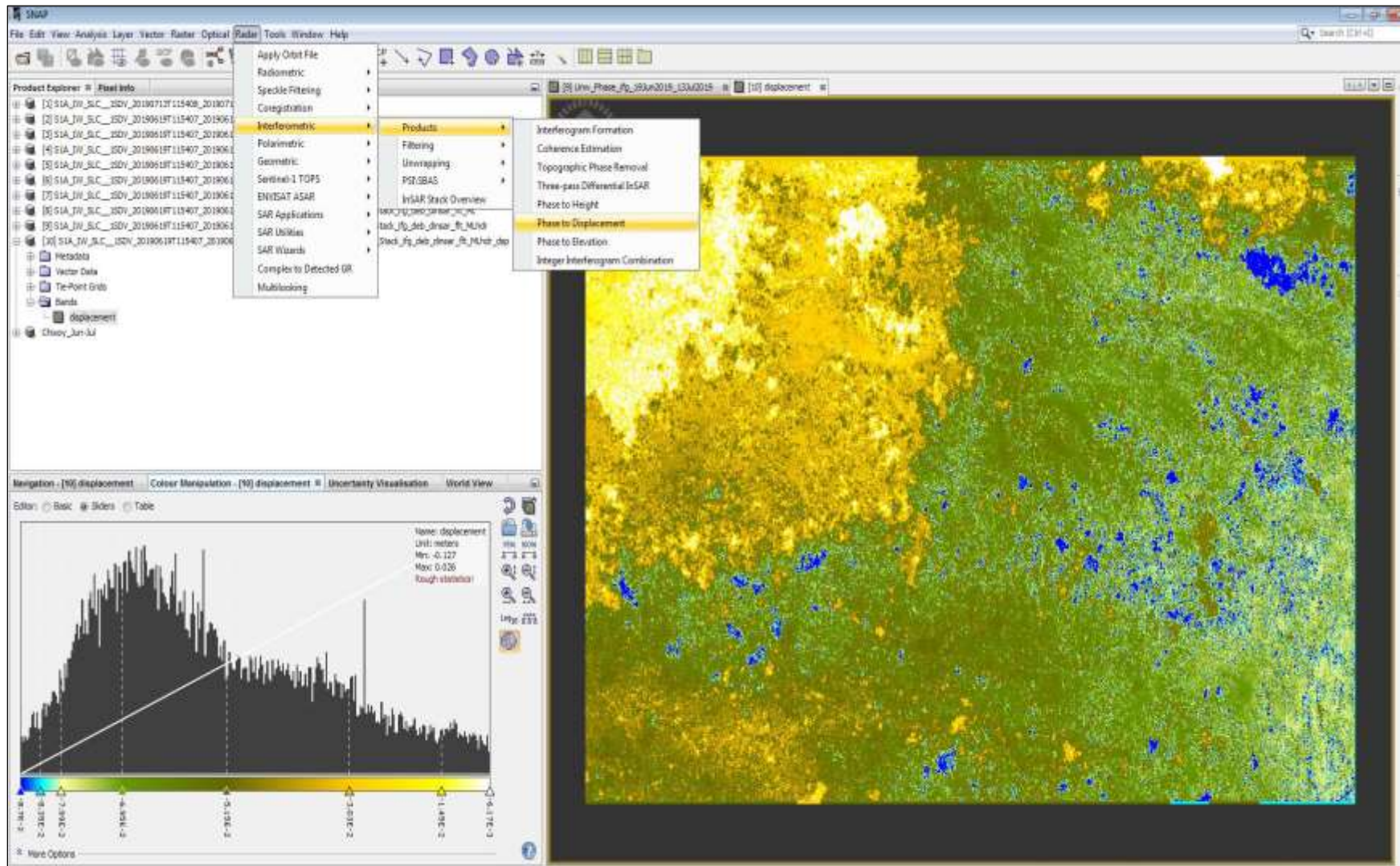




Step 10.1 Processing this you get:

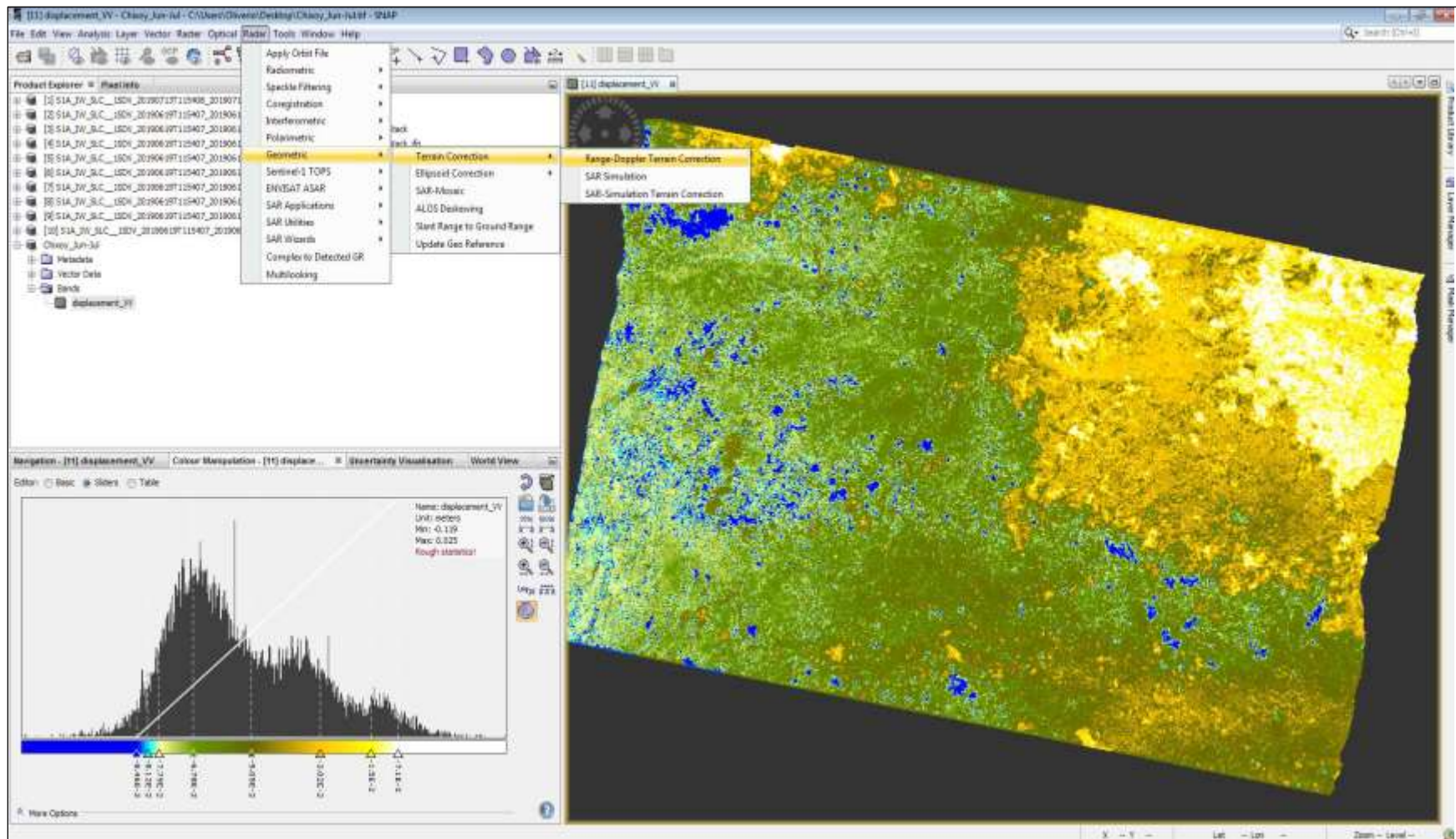


# Step 11. Phase conversion in displacement





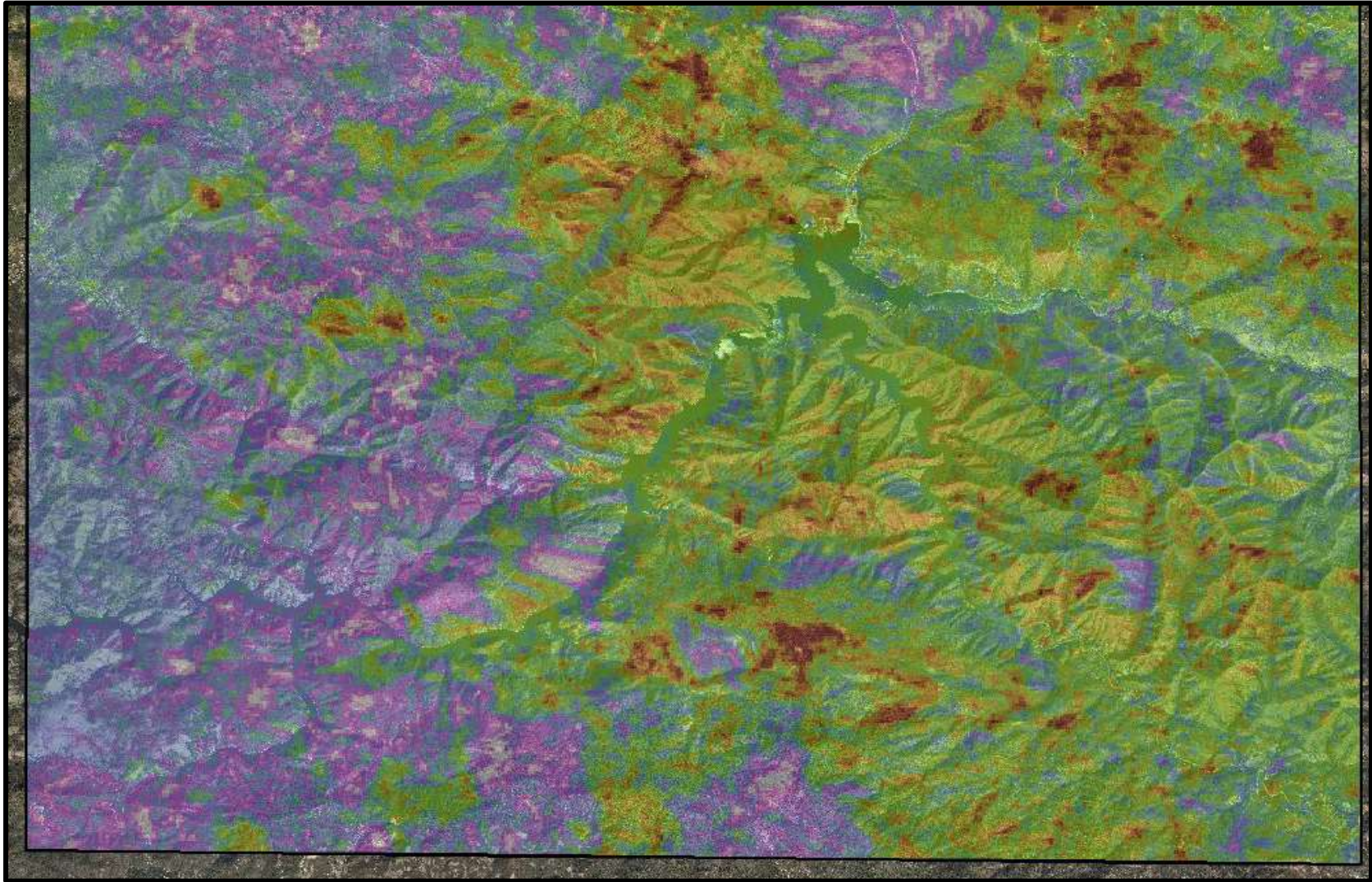
## Step 12. Results of geocoding and correction by topography



In Processing parameters, select source bands and output bands.



Step 13. The file obtained is exported as a tiff for processing in QGIS 3.10





From the steps applied I ask for your opinion and the answers according to your experience for the following questions:

1. If the water does not discriminate in the interferogram. How do you eliminate the effect of coherence in slow waters?
2. If the band can identify areas identified by the potential for water erosion and wind erosion in areas without vegetation cover
3. And if the interval time of 1 year can be taken as a reference for surface deformation or subsidence?

Regards,

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