SNAP Usage Notes for NovaSAR-1

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(Document produced by SSTL)

General Notes

SNAP processes images in an uncalibrated format. As NovaSAR images are emitted by the IFP fully-calibrated, this step which is automatic in many of the RADAR tools must be cut out by recreating the tool without the calibration step.

SNAP also has issues working on very large images, and cutting an image down using the Raster->Subset (or using Sliced images from the IFP) is a requirement (unless using a powerful computer with plenty of storage, RAM and processing power).

Tool	Relevant?	Notes
Apply Orbit File	No	Not needed as images generated with precise data.
Radiometric (all sub-tools)	No (Except Radiometric Terrain Flattening)	NovaSAR images are provided fully radiometrically calibrated. Scaling in Beta0/Gamma0/Sigma0 is provided by IFP. However, Radiometric terrain flattening will execute according to the information later in this note.
Speckle Filtering	Yes	Does not calibrate the image first. Works on ScanSAR, Stripmap (GRD/SRD)
Co-Registration	Yes (Some)	Co-Registration, DEM-Assisted Co-Reg and Stack tools work, assuming properly configured process steps. Note that Orbit coregistration will not work as SNAP will assume Sentinel.
Interferometric	Yes – With Correct Data	Given correctly co-registered data of SLC stripmaps of similar swaths interferometry is possible, however I cannot individually test each option as there are currently no images of similar swaths that are both generated with GPS data.
Polarimetry	No	There are no NovaSAR products that produce SLC multi-polar images.
Geometric	Yes	See next table for details
S-1 TOPS	No	This is not applicable to NovaSAR.
ENVISAT ASAR	No	Not applicable to NovaSAR.
SAR Applications	Yes (Some)	Wind Field Estimation is incompatible with NovaSAR, due to the fact that NovaSAR is an S-band SAR system. Offset Tracking and Change Detecion have not been tested. See Document for steps to run other tools.
SAR Utilities	Yes (Some)	There are no NovaSAR Auxilliary Files compatible with SNAP. All other tools work with manual removal of the Calibration step or out-of-the-box.

Geometric Tool	Relevant?	Notes
Terrain Correction	Yes	All tools in this menu will execute on NovaSAR data, provided the data is in slant range (SRD/SLC).
Ellipsoid Correction	Partial	Average-Height Range Doppler Ellipsoid correction works, the Geolocation-Grid deos not as this requires a slant-range time tie-point grid, which NovaSAR does not provide. These require Slant Range (SRD/SLC) data.
SAR-Mosaic	Yes	For optimal compatibility, do not normalise the image in the SAR-Mosaic tab.
SAR-Mosaic Wizard	No	This tool performs the Calibration step in its processes. Each step should be executed separately and then the SAR-Mosaic op used.
ALOS Deskewing	No	This is not applicable to NovaSAR.
Slant Range to Ground Range	Yes	This works out-of-the-box on all Slant Range images to produce a single-look GRD. However the IFP GRD product achieves better pixel spacing with multilooking.
Update Geo-Reference	Unknown	The tool starts to process the image successfully, however it seems to consume large amounts of memory and CPU, causing SNAP to crash, even with a relatively small image. Perhaps with a better workstation than mine this will work effectively.

## Functions that work when manually omitting Calibration Step

To manually omit the calibration step, open the Graph Builder view.
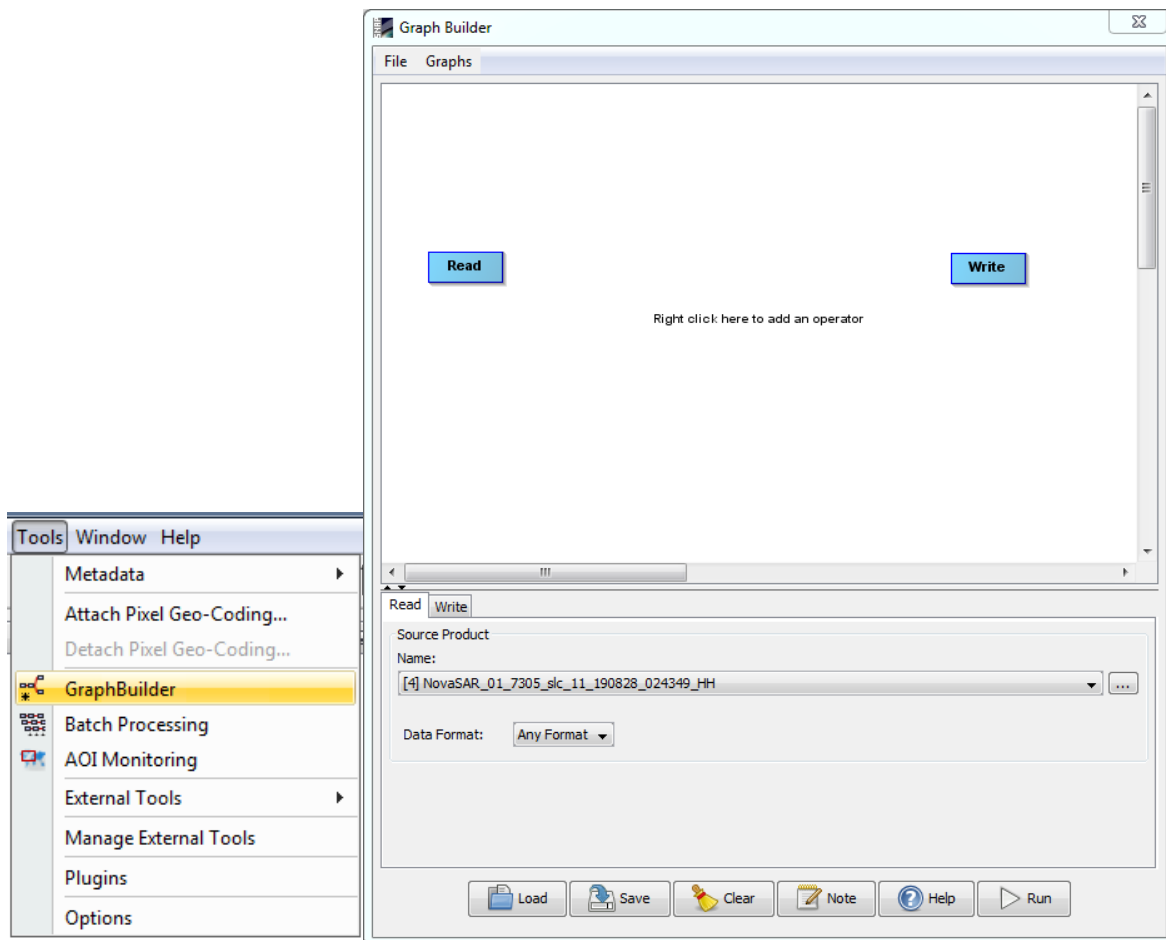
Recreate the steps from the tabs of each analysis view in the Graph Builder, omitting the Calibration step. This step is not needed as NovaSAR images are supplied fully calibrated.

Conversion of SLC to GRD image

Read/Write are already inserted. Find other blocks by right-clicking in graph-space and selecting Add->Radar then find the block required.
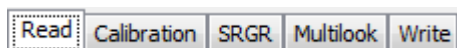
Tabs from tool with Calibration.

Steps recreated and omitting calibration in graph view.

This tool works well, however selection of the Interpolation method in the SRGR tab may need to be changed. This tool will only work on SLC images, therefore only StripMap images are relevant.

Ocean Object Detection

Read/Write already inserted. Find other blocks by right-clicking in graph-space and selecting Add->Radar then find other blocks required.

Tabs from tool with Calibration

Steps recreated and omitting Calibration in graph view.

This tool works very well with ScanSAR and Stripmap data of anything with ships.

Radiometric Terrain Flattening

Due to how SNAP detects if an image is scaled in beta0, you will need to create a new band named "Beta0_Intensity_<POL>". This can be done by right-clicking a band and selecting Band Maths. In the equation, use "Intensity_<POL>", and set the Unit field to "intensity" Radiometric Terrain flattening can now be performed on this virtual band.
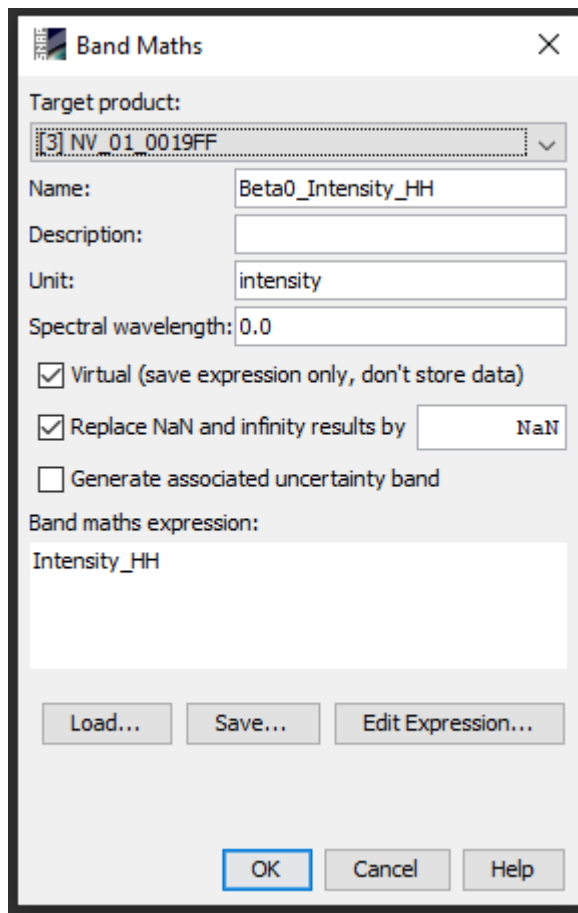
Other Features of SNAP

Product Library

SNAP's built-in product library will detect and read NovaSAR metadata.xmls if set to recursively search a folder containing these files. Due to a character limit issue within SNAP, some images will not be able to be read by the Product Library tool.