

SARPOLTool V3.1 – Multi-Mission POLSAR Processing and Analysis Tool

SARPOLTool V3.1 is an Advanced Multi-Mission SAR Toolbox designed for Synthetic Aperture Radar (SAR) and Polarimetric SAR (PolSAR) data processing, Analysis, Visualization & Application development. The Toolbox offers an end-to-end solution enabling researchers, scientists, and analysts to efficiently process multi-sensor SAR datasets, generate radar backscatter products, apply advanced speckle filtering techniques, perform polarimetric decompositions, and derive thematic information products. Integrated seamlessly as a plug-in within QGIS, SARPOLTool allows users to perform sophisticated SAR analysis without relying on external processing environments, ensuring a streamlined workflow and enhanced productivity.

The Key Functional Capabilities (Multi-Mission SAR):

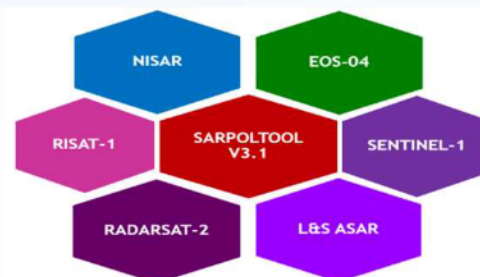
Unified SAR Solution: Operates directly with SAR Sensor data as a plug-in in QGIS without the need for external tools—seamless analysis and visualization.

- **Polarimetric Decompositions:** Supports full and compact polarimetric decompositions for in-depth SAR data analysis.
- **Sigma Naught Processing:** Includes sigma naught generation for accurate backscatter analysis.
- **Customized SAR Speckle Filters:** Apply tailored filters to enhance image quality, improving clarity and feature extraction.
- **False Colour Composite (FCC):** Creates visually compelling false color composites from SAR data for better analysis.
- **Batch Processing Support:** Process large number of SAR datasets in bulk, improving efficiency.
- **Time Series Analysis:** Efficient handling of time series data for generating temporal profile to monitor dynamic changes.

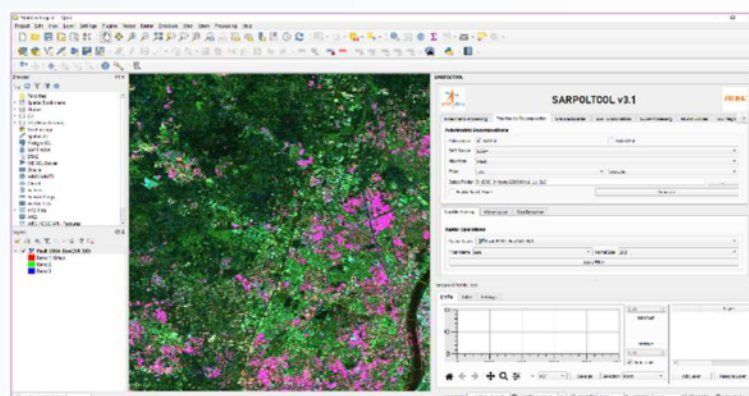
NISAR Specific Functionalities:

- **Complete HDF to GeoTIFF/COG Conversion:** User can convert entire HDF file of NISAR products to GeoTIFF or Cloud Optimised GeoTIFF format along with metadata decoding in XML format.
- **AOI-Based HDF to GeoTIFF Conversion :** Users can define an Area of Interest (AOI) through Lat, Lon, Bounding box size or by shape file to convert HDF datasets of NISAR into GeoTIFF format, significantly reducing processing time.
- **Polarimetric Decomposition for NISAR Data Products:** Enables polarimetric decomposition of entire NISAR datasets from HDF files. M-delta, M-chi, M-alpha decompositions for Hybrid polarimetric data and Freeman-Durden decomposition for Full Polarimetric data are supported for RSLC, GSLC and GCOV.
- **AOI-Based Polarimetric Decomposition:** Supports polarimetric decomposition restricted to user-defined AOI, allowing faster processing and focused analysis of specific regions of interest.
- **Radar Backscatter Estimation for NISAR Products:** Provides radar backscatter estimation for entire scenes and AOI-based processing for NISAR data products including: GCOV, RSLC and GSLC.

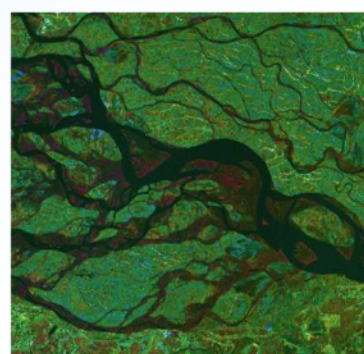
<https://bhoonidhi.nrsc.gov.in/bhoonidhi/help/tools.html>



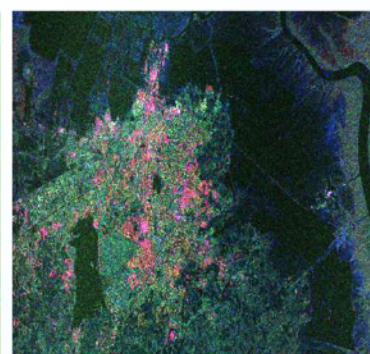
SAR Sensors Supported – SARPOLTool V3.1



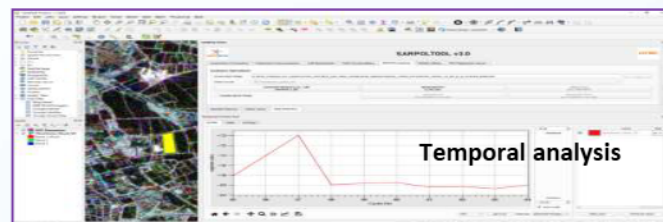
SARPOLTool V3.1 Interfaced with QGIS



NISAR Hybrid Pol image of Brahmaputra river with m-delta Decomposition



NISAR Full Pol image of Bhavnagar with Freeman-Durden Decomposition



Temporal analysis

Web links:

bhoonidhi.nrsc.gov.in

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