

A new service for computing Sentinel-1 InSAR interferograms using NSBAS.

ForM@ter, the French Solid Earth data and services centre develops an on-demand service for Sentinel-1 InSAR processing. This project is done in the framework of EPOS (European Plate Observatory System) Satellite Data Thematic Core Service, as part of the GDM (Ground Deformation Monitoring) service. All the GDM products will be available through the ESA platform GEP (Geohazards Exploitation Platform).

The service has been implemented considering the needs expressed by the scientific community to support the use of the massive amount of data provided by radar satellites of the European Sentinel-1 mission. The Sentinel-1 mission opens new potential for an intensive use of SAR interferometry to measure ground deformations thanks to its worldwide systematic background acquisition strategy and a 6-days revisit time. However, the new default mode of acquisition (TOPSAR) and the amount of data available in near real time, require new processing schemes, and significant computing and storage facilities not available to every researcher.

With our service, users can launch a computation of either a single interferogram or a network of coregistered interferograms. In a second phase, it will propose computation of associated time-series of unwrapped phase.

The user interacts with a web application that queries a set of web services, which in turn submits jobs to a dedicated HPC cluster. Input data are Sentinel-1 images downloaded from the French Collaborative ground segment for Copernicus Sentinel program (PEPS) operated by the French Spatial agency (CNES), that provides a mirror site distributing all the Sentinel data in near real time. InSAR processing is performed using the NSBAS chain (Doin et al. 2011) based on ROI_Pac and implemented to process TOPSAR mode Sentinel-1 images (Grandin, 2015). Each web service is implemented according to the OGC standard WPS in order to offer a normalized and GEP platform compliant access to the service.

The results obtained are a set of products:

- Intermediate products computed during the processing
- Metadata files which are compliant with the EPOS WP 12 recommendations

Preview images in PNG format, images for wrapped and unwrapped interferograms in ROI_Pac and Tiff format both in geocoded and radar geometries.

These products are published on local servers, data servers like Zenodo and metadata including link to the data are also available on the GEP catalogue. Users can display and analyze them online with the application and downloaded them.

A demonstration of the service will be given as well as a presentation of its architecture and operation.