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Description of the DIAPASON software developped by CNES current and future applications

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Abstract

SAR interferometry has demonstrated its capability to produce large scale digital elevation models or to detect small moves of various origins, such as surface deformation produced by large earthquakes, landslide, subsidence, smaller earthquakes or fault slip as small as 2 cm. More studies detected glaciers movements or phase surface changes.
CNES engaged itself in an effort to give interferometry a scientific and operational status which requires a lot of activity along two axes:

The precise understanding and quantification of the phenomena involved in the interferometric measurement
The assessment of the extent and the gravity of coherence losses, which is critical for interferometric applications assessment and scene selection.

This have been made possible by an in-depth analysis of a large amount of data, that in turn, demands the availability of an almost fully operational interferometric processing chain. Such a tool (called DIAPASON) has been developed at CNES and processed more than one million square kilometres of interferograms and spotted interesting phenomena: landslide, earthquake, volcano atmospheric propagation errors, ...
New applications may be much more demanding in terms of scene length and calibration accuracy.
An example where interferometry would be pushed forward in terms of performance is the measurement of local tidal loads on Earth's crust, caused by ocean tides. We plan to study the effect of such a loading. For this purpose we should be able to study a 600 km long scene for the detection of centimetre sized phenomena.
Last results over recent earthquakes and atmospheric artifacts detection will be shown.
Keywords: