Methods – Unwrapping

Chairs: M. Crosetto & M. Costantini

Summary

- The session included four presentations:
  - A 3D (spatio-temporal) approach: extended minimum cost flow
  - A model-based unwrapping, where the importance of the thermal expansion component of X-band phases was highlighted
  - A redundant 3D phase unwrapping approach
  - A 2D unwrapping on homogeneous image segments

- Outcomes of the round table discussion:
  - Phase unwrapping is still a key problem in SAR interferometry?

    Yes, it is: the ambiguous nature of the phases is a key intrinsic limitation of the technique, with an important impact on many InSAR/DInSAR/PSI applications.

  - Are the methods able to provide a quality index associated with the unwrapped phases, e.g. three classes: highly reliable, reliable and problematic phases?

    This would be useful to help a correct exploitation of the results, but for the moment there is not much research activity on this.

- Both 3D and 2D methods are used to unwrap phases.

  3D methods require important computational efforts. However,

  this is not seen as a major limitation, given the expected development of computation tools.

  3D methods offer the advantage of analysing automatically large data sets, this is in particular useful in difficult areas.

- Model-based techniques can help phase unwrapping. This is usually done by estimating, from the wrapped phases, deformation velocity and the residual topography, removing them these components before phase unwrapping. For VHR X-band data it is suggested to extend the model to include the contribution of thermal expansion.