Small Baseline Subset (SBAS) InSAR Analysis Using Sentinel-1 Data for Monitoring Landslide Deformation in the Alps

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1 MOTIVATION, STUDY SITES & DATA

- Evaluation of Sentinel-1A/B data performance for monitoring vegetated landslides
- Investigation of the role of high-resolution and updated DEM in topographical phase removal
- Assessment of landslide kinematics using both Permanent Scattering Interferometry (PSI) and Small Baseline Subset (SBAS) techniques

2 METHOD AND DATA PROCESSING

- The SBAS [1] processing was run with the SARScape software (SARMap 2012) involving the six steps in the Fig. 3a. The coherence value of 0.3 and two phase unwrapping methods (i.e. 20 and 30) was used. The PSI [2] processing performed similar to the SBAS method except for the refining and reflating step

3 RESULTS - DEFORMATION MAPS 1

- PSI-SBAS results comparison for the Corvara landslide

4 CONCLUSION AND FUTURE WORK

- Vegetation changes on the landslide were a limiting factor to have the coherent interferogram pairs. However, adding Sentinel-18 data (with 6 days of the revisit time) and discarding pairs connections during winter season increased up to twice the coherence.
- The results of the SBAS and PSI processing for the Corvara landslide provided RMSE between 6-18mm.
- 2D phase unwrapping is more accurate than 3D one (due to lack of redundancy that is necessary for an efficient 3D unwrapping
- On the Reissenschuh site

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- Outlook: Processing PSI including the 6-Cband artificial corner reflectors installed on the landslide (see Fig 5) with small perpendicular and temporal baselines of Sentinel-1A/B data would increase PSI density for a better creation the deformation map.
- On the Reissenschuh site: Due to the lack of the overlap between SBAS&PSI pixels and GPS measurements we could not validate our results. However, the vertical displacements derived from SBAS generally shows similar displacement patterns with the difference of DEK6 from 2008-2016.
- On the Reissenschuh site: During the same period

References: