Impact of rockfall catch fence on monitoring with GB-SAR

The general research topic is related to the possibilities and limitations of the Ground-Based Synthetic Aperture Radar (GB-SAR) technique for the natural hazards monitoring. The goal of presented experiment was to find out whether or not a rockfall catch fence has an impact on deformation monitoring using microwave interferometry.

1. **Experiment (Quarry in Felsberg)**
   - Two positions of the fence: <1m and 7m from the rock wall
   - Four scenarios per location: reference, different fences
   - Five radar acquisitions per scenario
   - One TLS acquisition per scenario

2. **Radar data flow**
   - Received SR-CW signal
   - Focusing
   - Transformation to local radar coordinates
   - Persistent scatterers selection
   - Atmospheric correction
   - Displacements

3. **Results overlayed on DTM (examples)**
   - Significant changes of the reflected power up to -50 dBm
   - Significant changes of the coherence up to -0.8
   - False displacements of the stable rock wall up to 3 mm

4. **Impact of the scenarios on the results**

5. **Outlook**
   - How to reduce the above impact (relative rock-fence-sensor geometry, different fence material or fence coating)?
   - Comparison to impact on TLS-based deformation monitoring.