[EJ] Evening Poster | S (Solid Earth Sciences) | S-TT Technology & Techniques

[S-TT48]Synthetic Aperture Radar

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ALOS-2 and Sentinel-1, which have highly enhanced capacity compared to previous SAR satellites, were launched in 2014, and their utilization has been widely expanding as the data has accumulated. Now we are facing a new and abundant era of the satellite SAR, along with a worldwide trend to an open and free data policy of satellite data, and with next-generation advanced SAR satellite plans by several countries. In addition, SAR technologies with other platforms, such as ground-based SAR with high temporal resolution and UAV (Unmanned Aerial Vehicle) SAR with flexible operability, have also been developed and used for various targets. These facts indicate that the SAR utilization data has become widespread in both basic researches (e.g., earth science) and diverse applications (e.g., disaster prevention and forest monitoring). In this session, we would like to share a broad knowledge and information regarding SAR. A wide range of research topics from basic researches to advanced applications will be welcomed.

[STT48-P12]Phase ramp on SAR Interferograms caused by Beam Steering in Azimuth

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SAR Interferometry is a technique which utilize the phase information of the SAR images to detect topography or surface displacement which took place between two observations. Fundamental observation mode of the SAR is called stripmap mode, which transmits radar beam in the direction perpendicular to azimuth direction. Many interferometric analysis techniques are developed using this mode.

In recent years, however, new observation mode, which electrically steers the beam in azimuth direction, became available. When conventional interferometric analysis is applied on such data, overlapping phase ramp caused by this beam steering is observed. We applied correction of this phase ramp to Sentinel-1 TOPS and PALSAR-2 spotlight mode images generated by RINC (*Ozawa et al., 2016*).

TOPS (Terrain Observation by Progressive Scans) mode steers the beam direction from backward to forward, to observe wider region in shorter observation time. The formulation of the phase ramp can be found in *Miranda (2015)* and *Grandin (2015)*. We applied their correction, however linear phase trend in azimuth direction remained.

Spotlight mode, on the other hand, steers the beam direction from forward to backward to improve azimuth resolution by illuminating smaller region for longer period. Phase ramp in spotlight mode interferogram can also be removed by proper phase operation. However, linear phase trend in azimuth direction remained, as in TOPS case.

Such phase trend can be easily estimated and removed based on the interferogram, though this is not always applicable since it requires high fringe visibility. We will further investigate this linear phase

trend.

We also investigated how other analysis softwares (GAMMA and GMT5SAR) handle these phase ramps. Both turned out to be able to correct phase ramp in TOPS mode interferogram and no remaining linear phase trend is observed. For spotlight mode interferometry, interferogram generated by GAMMA shows linear trend seen in our result, while GMT5SAR did not support the removal of the phase ramp.