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PALSAR ScanSAR Interferometry Using The Modified Full Aperture Processing

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ScanSAR processing is represented by a Specan SAR and a full aperture SAR, latter of which creates the interpolated raw data from the intermittently transmitted and received signal and zero padding based on the transmit/receive timing. Here, we propose a modified full aperture ScanSAR imaging that performs the azimuth correlation for the azimuthally resampled range compressed data using the referenced PRF-value. This method allows the creation of the full swath SLC and allows the co-registration easily in the InSAR processing. We have tested the sensitivity of the ScanSAR interferometry for various types of the targets, disaster, desert, forest, and evaluated the coherence dependence on the beam synchronization.

At the operation of the PALSAR ScanSAR imaging (amplitude), we adopted the SPECAN SAR processing algorithm for the PALSAR wide-swath (ScanSAR) imaging [1][2]. The Specan method [1] minimized the three representative problems that the ScanSAR faces, i.e., scalloping, azimuth ambiguity, and inter-scan banding. While the SPECAN algorithm exceeds the full aperture SAR processing in that no out-of-use area exists, i.e., synthetic aperture length, in the processing phase, the phase continuity over the contiguous burst seems to be difficult. The PALSAR first Specan ScanSAR-ScanSAR interferometry was tested [3]. We first compared the strip InSAR and Specan InSAR for the simulated ScanSAR from the strip. This does not generate any discontinuity between the images. Second image is the ScanSAR result for the Saharan Desert area, which shows the relatively high coherence and the very good fringe. However, the problem was the discontinuity of the fringes. Third example is the ScanSAR of the south of the Tanzania area. This also shows high coherence and good fringes. But the problem was the phase discontinuity. Thus, in this paper, we propose a modified full aperture ScanSAR processing and its application to the ScanSAR Interferometry.

Keywords: SAR, ScanSAR InSAR, Surface Deformation, ALOS