

A Novel Interferometric SAR Processor and its Applications

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Abstract

Registration of SAR images is an important part of investigations which require correlation of multitemporal, multifrequency or multipolarization data. In SAR interferometry residual registration errors reduce the correlation of interferometric image pairs, which complicates the phase-unwrapping and results in less accurate DEM's. The common approaches start from separately processed Single Look Complex (SLC) images and achieve a co-registration by choosing one image as the reference and resampling of the other image to the geometry of the reference image. These methods increase the overall computing time of interferometric processing and interferogram generation considerably.

We developed a novel approach for an interferometric SAR processor, which combines image processing and co-registration in one simultaneous step. The procedure is based on the Extended Chirp Scaling Algorithm and has been implemented for data from spaceborne SAR sensors. Intensive tests on simulated and real SAR data from ERS-1/2 verified the functional and interferometric performance.

Keywords: SAR Processing, Image Co-registration, Extended Chirp Scaling