



Interferogram noise reduction based on Windowed Fourier Transform

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InSAR is a powerful technique to produce topographic information and deformation maps using interferometric phase. However, the interferometric phase should be unwrapped in order to obtain the desired information. The number of residues in the interferogram will be increased due to the presence of noise. As a result, the phase unwrapping will be nearly impossible. Hence, the noisy interferogram should be filtered before phase unwrapping. In this paper a filter based on Windowed Fourier Transform (WFT) or Short Time Fourier Transform has been developed for interferogram noise reduction. The presented approach does not need to divide the interferogram into sub-windows nor an initial input as a threshold. The proposed method has been validated using simulated noisy interferograms as well as real interferograms and the results have been compared with Goldstein and Werner algorithms applied in DORIS and Gamma softwares. The achieved results demonstrate the superiority of the proposed WFT-based filter in noise reduction compared to Goldstein and Werner filter. Furthermore, the proposed approach reduces the number of residues in the denoised interferogram and improves the phase unwrapping results.