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MULTI-TEMPORAL SAR CHANGE DETECTION AND MONITORING

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Keywords: Spatio-temporal NL-means filtering, Rayleigh Kullback Leibler, Rayleigh Distribution Ratio, DSMT fusion, temporal classification

Abstract. Multitemporal SAR images are a very useful source of information for a large amount of applications, especially for change detection and monitoring. In this paper, a new SAR change detection and monitoring approach is proposed through the analysis of a time series of SAR images covering the same region. The first step of the method is the SAR filtering preprocessing step using an extension of the spatial NL-means filter to the temporal domain. Then, the Rayleigh Kullback Leibler and the Rayleigh Distribution Ratio measures are combined to detect the changes between a reference image and each SAR image of the time series at both local and global scale. These measures are combined using the Dezert-Smarandache theory which takes into account conflicts between sources and thus enhances the dual change detection results. Finally, a pixel based temporal classification is applied starting from the obtained change maps in order to describe the temporal behaviour of the covered regions.

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