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Efficient Ground Targets Detection Using Compressive Sensing in Ground-Based Synthetic-Aperture Radar (SAR) Images

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Abstract : Detection of ground targets in SAR radar images is an important area for radar information processing. In the literature, various algorithms have been discussed in this context. However, most of them are of low robustness and accuracy. To this end, we discuss target detection in SAR images based on compressive sensing. Firstly, traditional SAR image target detection algorithms are discussed, and their limitations are highlighted. Secondly, a compressive sensing method is proposed based on the sparsity of SAR images. Next, the detection problem is solved using Multiple Measurements Vector configuration. Furthermore, a robust Alternating Direction Method of Multipliers (ADMM) is developed to solve the optimization problem. Finally, the detection results obtained using raw complex data are presented. Experimental results on real SAR images have verified the effectiveness of the proposed algorithm.

Keywords : compressive sensing, raw complex data, synthetic aperture radar, ADMM
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