

EARTH OBSERVATION SYMPOSIUM (B1)  
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## MOVING TARGET DETECTION AND IMAGING BASED ON SPACEBORNE VIDEO SAR

**Abstract**

Video SAR(synthetic aperture radar) is a new imaging mode which can provide a continuous surveillance over a region of interest. The main purpose of a video SAR application is detecting moving targets and estimating their velocity and position. This paper details a method to track and detect the moving target using the TBD(track before detect) algorithm. Based on the tracking information a technique for estimating their velocities and for compensation of their motion is presented. After detecting and tracking of the moving target, the displacement vectors between each two successive images of SAR video can be estimated. Some image defects are encountered when moving targets in the scenery due to the targets' moving. The significant effects include shifting and blurring of the object in azimuth directing. Then the analytical relationship between the displacement vector and azimuth velocity of moving target is obtained using RD(range-doppler) algorithm and SPP(stationary phase principle). The range velocity and position can be directly obtained from the displacement vector and the images of the SAR video. The azimuth starting point is corrected with the offset caused by the range velocity. Thus the velocity and position of the moving targets have been estimated. Using the motion parameters, the moving targets can be focused and positioned in the images of SAR video. After these estimation and compensation, the SAR video is displayed with the moving targets in the correct position and whose velocities are correctly estimated. The proposed method were applied to simulated and true SAR raw data, simulation results demonstrate that the method is effective.