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# Employment of Generalized Detector in Synthetic Aperture Radar Systems for Ship Detection

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***Abstract*— This paper considers a ship detection in synthetic aperture radar (SAR) systems constructed on the basis of generalized detector (GD). To obtain better results without ambiguity it is better to use multi-channel SAR with more than two antennas. However, there are very few SAR systems with more than a single antenna, which is because of the complexity and immense data rates produced by multi-channel systems. So, it is preferred to use single channel SAR systems. In this research a single channel Envisat image is considered, in order to have more accurate result the symmetrical sub-aperture images (multi-look) are obtained from splitting a $1024 \times 1024$ part of Envisat image. The GD which is a combination of the Neyman-Pearson detector and the energy detector is applied on three separate sub-apertures with a limited number of ships. The intensity of pixels are compares with the GD threshold to make a decision statistics under hypothesis $H_0$ and $H_1$ to find ships in the sub-apertures.**

**Keywords—Generalized detector (GD), synthetic aperture radar (SAR), sub-aperture.**