



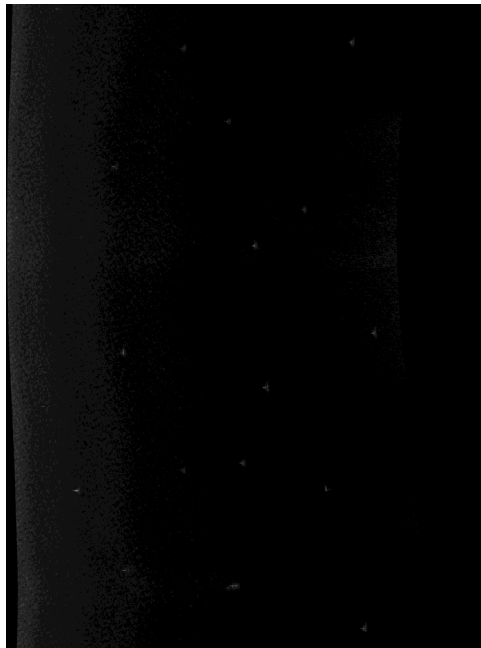
## Ship Detection using L&S Band Airborne SAR Data

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The use of remote sensing for ‘Maritime Surveillance’ has increased drastically in recent years and with advances in SAR technology it is possible to monitor the waters in all climatic conditions. Maritime Surveillance can have wide range of applications from defense point of view to Disaster Management and Rescue Operations. The objective of this paper is to use L&S Band Airborne SAR Data of Mumbai Offshore Region for ship detection using a pixel-based algorithm for marine object detection eliminating false alarms caused by azimuth ambiguity or sea clutter. The complex image is pre-processed using an average filter of window size  $5 \times 5$  and also enhanced Lee Filter is used after generation of Amplitude Image. The algorithm works on amplitude image as it gives high contrast between ships and background sea surface. It uses machine learning clustering algorithm for target detection. A local threshold is calculated and pixels having value above this threshold are clustered to form a target. Also, various attributes of the detected targets like size, direction of heading, location are calculated in order to give an accurate description of ships and its characteristics.



**Figure 1.** Gray level Amplitude Image of Airborne Data. ( $19.407286^\circ$ ,  $71.356619^\circ$ ; Mumbai Offshore Region)

1. Greidanus, H.; et. al.; “The SUMO Ship Detector Algorithm for Satellite Radar Images”, *Remote Sens.* **2017**, *9*, 246.
2. Xing Xiangwei et. al., “A fast ship detection algorithm in SAR imagery for wide area ocean surveillance”, IEEE Radar Conference, 7-11 May, 2012, USA.