Verification of automatic SAR-based ship detection

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The objective of this study is to perform a review of automatic SAR-based ship detection using an algorithm developed by NDRE (Norwegian Defence Research Establishment), and to find the optimal parameter settings and beam modes. This review is performed using datasets mainly from ENVISAT ASAR Alternating Polarization mode and Wide Swath mode, but datasets from RSAT1 are also used.Ship positions from AIS, coastal radar and from visual inspection by plane / aerial photo are used to be able to verify the results.For ENVISAT AP mode, cross-polarized channels are recommended to use for ship detection at steep incidence angles, since the TCR (Target to Clutter Ratio) increases with decreasing incidence angles for co-polarized channels. At larger incidence angles, co-polarized data are recommended. For ENVISAT WSM, H/H polarization is supposed to be better for ship detection than V/V. This is because the ocean backscatter is slightly lower for H/H. This study compares the polarizations and modes in order to find what's best for automatic ship detection.For RSAT1 the recommended beam mode is SCN Far, in order to keep the ocean backscatter as low as possible. In this study we compare the results of ship detection performed on different polarizations and swaths in order to find the optimal settings for the ship detection software.