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Strempel MD, De Villiers JP, Cilliers JE and McDonald A

Abstract

This paper investigates the littoral sea clutter amplitude distributions associated with individual segments within a periodic wave. Low grazing angle, X-Band sea clutter data, obtained from the CSIR online database was utilised for this study. The dataset contains fixed frequency pulsed radar returns of low grazing angle sea clutter with a pulse repetition frequency (PRF) of 2.5kHz. The processing involves correcting the data by means of rotation such that the periodic wave phase structures within the data align over time and are parallel to the longtime axis. Thereafter, the data and thus the wave structures are segmented into multiple partitions, where each partition represents a section of the wave phase in the range dimension. These segments are then fitted against the K-distribution. It is shown that the approach can accurately describe specific sections of the wave with a reduced error between actual and estimated distributions. The improved probability density function (PDF) representation will allow for more accurate data analysis and data generation in littoral environments, which can be used for the development of new detectors, as well as the simulation of their performance.