

Ambiguity Resolution for Ground-based Pulse Doppler Radars Using Multiple Medium Pulse Repetition Frequency

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Abstract : In this paper, we propose an adaptive method to resolve ambiguities and a ghost target removal process to extract targets detected by a ground-based pulse-Doppler radar using medium pulse repetition frequency (PRF) waveforms. The ambiguity resolution method is an adaptive implementation of the coincidence algorithm, which is implemented on a two-dimensional (2D) range-velocity matrix to resolve range and velocity ambiguities simultaneously, with a proposed clustering filter to enhance the anti-error ability of the system. Here we consider the scenario of multiple target environments. The ghost target removal process, which is based on the power after Doppler processing, is proposed to mitigate ghosting detections to enhance the performance of ground-based radars using a short PRF schedule in multiple target environments. Simulation results on a ground-based pulsed Doppler radar model will be presented to show the effectiveness of the proposed approach.

Keywords : ambiguity resolution, coincidence algorithm, medium PRF, ghosting removal

Conference Title : ICR 2022 : International Conference on Radar

Conference Location : Istanbul, Türkiye

Conference Dates : September 27-28, 2022