

Design of Detection-Jamming Shared Waveform Based on Virtual Force Field Algorithm

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Abstract

Due to the technical barriers between radars and jammers and the poor performance of the traditional detection-jamming shared signal in integrated radar-electronic warfare systems, a new detection-jamming shared signal waveform based on the virtual force field algorithm (VFFA) is proposed in this paper. First, a multi-objective and multi-dimensional characteristic parameter optimization model, based on a virtual force field, is established, and then the design principle of the shared signal is presented in detail. The simulation results show that the detection-jamming shared signal based on the VFFA presents the deceptive jamming of multiple false targets in non-collaborative radar. Further, there is better detection performance with the advantages of multiple pulse repetition frequency (PRF) and pulse accumulation number, which are highly sensitive to the multi-jagged PRF signals emitted by the non-collaborative radar. According to the VFFA described in this paper, the optimum detection-jamming shared signal waveform can be output in real time for specific free space targets, to improve the efficiency of integrated radar and electronic warfare systems.

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