

Design of Low-Interception Short-Range Detection Signal for Co-Address MIMO-OCDM

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Abstract—The rapid development of electronic reconnaissance system has seriously threatened the survivability of fuse. To improve the survivability of fuse, a co-address Multiple Input Multiple Output-Orthogonal Chirp Division Multiplexing (MIMO-OCDM) signal is designed, and a signal processing method of two-phase parametric accumulation is adopted to improve the signal-to-noise ratio of the echo signal. Firstly, the transmission power of a single signal is evenly distributed to each sub-chirp signal of the OCDM signal, and the sub-chirp signals are transmitted by the co-address MIMO radar to reduce the signal transmission power. Subsequently, the first coherent accumulation is carried out on multiple sub-chirp signals received by a single antenna, and the second coherent accumulation is performed on the echo signals received by multiple antennas to significantly enhance the signal-to-noise ratio of the echo signals. The simulation results show that, compared with the traditional single signal, under the condition of ensuring that the echo signal-to-noise ratio is not lost, the co-address MIMO-OCDM signal can significantly reduce the transmission power of the signal, thereby resulting in a significant decrease in the interception distance of the electronic reconnaissance system and enabling the fuse to have excellent low interception performance.

Keyword—A Low Probability of Intercept, Signal Design, MIMO Radar, OCDM Signal, Signal Processing



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