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论文

基于和差波束极化特性的目标极化散射矩阵测量方法研究

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摘要
该文建立了一种基于常规单脉冲体制的目标全极化散射矩阵测量算法。首先证明了该型雷达天线具有复杂的极化结构，并且对回波信号的极化特性有一定的敏感性。利用单脉冲雷达和差通道的极化特性在获取目标角度信息的同时利用一个脉冲重复周期即可完成目标极化散射矩阵的测量，降低了全极化单脉冲雷达研发的系统复杂度和设计成本，通过电磁计算和仿真分析验证了上述研究的正确性。这对于开发现有雷达装备的极化测量处理能力、提升其抗干扰和目标识别能力具有一定的启发和指导意义。

关键词 单脉冲雷达 振幅和-差式 空域极化特性 散射矩阵测量

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A New Target Scattering Matrix Measurement Algorithm Based on Polarization Characteristics of Sum-and-Difference Beam

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Abstract
A new theoretical model for target scattering characteristic measurement based on ordinary mono-pulse radar system is proposed in this paper. The complexity of polarization structure in mono-pulse antenna is proved firstly. It is verified to be sensitivity to the polarization of target returns. Based on the polarization characteristics of sum-and-difference channel in mono-pulse radar, the PSM of target can be measured by signal processing of received signal in only one pulse interval which can be implemented greatly reduce the development complexity and production cost of fully polarimetric radar. By processing the electromagnetism computation data and simulation experiments, the validity of research work is demonstrated. All above have significant illumining and directing meaning for exploiting polarimetric measurements capability of current radar equipments and enhancing their information acquisition and processing capacity.

Key words Mono-pulse radar Magnitude sum-and-difference Spatial polarization characteristics Scattering matrix measurement

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