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一种探测低飞目标的PD雷达仿真系统

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摘要：

针对相参体制的脉冲雷达波形， 在综合考虑雷达平台及低飞目标运动规律的基础上，采用半空间物理光学结合图形电磁学，快速准确地计算了半空间低飞复杂目标的雷达散射截面,并按照真实地形的地形高程数据和地形地物特征，生成地杂波模拟数据。最后，采用频域信号处理方法对包含目标和杂波信息的雷达回波信号进行研究，实现对目标探测、测速、测距的功能。给出了仿真系统的总体架构和各模块的功能原理,并用仿真实例进行验证。

关键词： 半空间物理光学方法 真实地形 脉冲多普勒雷达 杂波仿真

Pulse Doppler radar simulation system for detecting low altitude targets

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Abstract:

According to the coherent pulse waveform of the narrowband radar, the radar cross sections (RCS) of low altitude flying targets in half space can be calculated quickly and accurately using a new algorithm which combines the half space physical optics method with the graphical electromagnetic computing (GRECO) method. Simultaneously the motion laws of the radar platform and radar targets are fully considered in this algorithm. Then the ground clutter in actual landform environment is produced. Finally, the radar echo signals including target and clutter information are studied with frequency domain signal processing methods. The functions of detecting radar targets and measuring distance and speed of them are realized in this simulation system. The architecture of the system, the functions and principles of each module, as well as demonstrating examples are given.

Keywords: half space physic optics method real terrain data pulse Doppler radar clutter simulation

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