

论文

噪声调频复合单频连续波雷达空间高速目标的探测

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收稿日期 2009-1-9 修回日期 2009-7-6 网络版发布日期 2010-2-4 接受日期

摘要

噪声调频连续波雷达由于发射信号无周期, 具有理想的图钉型模糊函数, 没有周期性距离模糊和速度模糊, 从原理上非常适合在轨探测远距离的超高速空间目标。该文采用插值法建立了噪声调频连续波高速目标回波模型, 提出噪声调频复合单频连续波雷达采用校正距离走动的“匹配参考信号”进行相参处理的方法, 实现跨距离门积累从而提高距离主旁瓣比; 针对多个目标的检测采用FFT-IFFT逐个“Clean”的办法, 进一步提高检测目标动态范围。仿真结果表明所提出的方法是有效可行的。

关键词 [连续波雷达](#) [噪声调频](#) [匹配参考信号](#) [高速目标](#)

分类号 [TN957.51](#)

High Speed Space Targets Detection Using Noise Frequency Modulation and Single Frequency Combined

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Abstract

Noise Frequency Modulated Continuous Wave (FMCW) radar has an ideal “thumbtack” ambiguity function, and unambiguous measurement of distance and velocity due to the nonperiodicity of its transmitting signal, so it is suitable for detecting high-speed and long-distance targets on orbit in principle. The high speed moving targets echo signals of Noise FMCW are generated by interpolation in this paper. An approach to improve the main-to-sidelobe ratio by utilizing “Matched reference signal” to correct the range migration in Noise FMCW and single frequency combined radar system is presented. The FFT-IFFT technique and “Clean” method are used to enlarge the dynamic range. Simulation results verify the effectiveness of this new method.

Key words [Continuous wave radar](#) [Noise frequency modulation](#) [Matched reference signal](#) [High speed targets](#)

DOI: 10.3724/SP.J.1146.2009.00024

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