

基于混沌调频信号的超宽带穿墙SAR成像

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Through-the-wall SAR Imaging Based on Chaotic FM Signal

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摘要

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摘要 混沌调频信号具有良好的自相关特性, 又类似随机信号, 具有较强的抗干扰性能。该文将基于Bernoulli映射的混沌调频信号用于超宽带穿墙雷达成像, 建立了信号模型, 分析了混沌调频穿墙雷达系统的目标检测性能, 分辨能力和抗墙壁多径干扰能力, 并与线性调频雷达系统进行了比较。仿真结果表明, 与线性调频信号相比, 混沌调频信号用于穿墙雷达系统可获得较好的目标检测性能, 更好的分辨能力, 而且具有抗墙壁多径干扰能力。

关键词: 雷达成像 超宽带 穿墙雷达 混沌调频信号

Abstract: Chaotic FM signal has ideal auto-correlation performance and good Electronic Counter-Counter Measure (ECCM) capabilities like random signals. In this paper, a type of chaotic FM signal generated by Bernoulli map is used for ultra-wideband through-the-wall imaging. The signal model is also built. After analyzing the detection capability, resolution capability and anti-multipath interference performance of chaotic FM radar system, it is compared with the LFM radar system. Simulation result shows that the chaotic FM signal is better than the LFM signal in target detection, resolution and anti-multipath interference when it is applied to through-the-wall radar system.

Keywords: Radar imaging Ultra-wideband Through-the-wall radar Chaotic FM signal

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