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一种结合ARMA的高精度穿墙雷达成像算法

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摘要 雷达穿墙检测是一项新颖的探测技术, 简要介绍了一种基于连续波的双频多普勒雷达以及应用这种雷达检测障碍物后运动目标的基本成像算法。分析了这种算法的主要特点, 并针对其主要的缺陷, 提出了一种新颖的ARMA (Auto-Regressive Moving Average) 修正模型, 成功改善了多普勒雷达中普遍存在的低分辨率和频谱混叠问题。对传统算法和基于ARMA模型算法的成像进行了仿真, 成像结果验证了改进算法的先进性和有效性。

关键词 [穿墙检测](#) [多普勒雷达](#) [自回归-滑动平均模型](#) [频谱分离](#) [Levinson递推](#)

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High-resolution through-the-wall radar imaging algorithm based on ARMA model

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Abstract

Radar through wall detecting is a kind of new technology of exploring. In this paper, a continuous-wave low-complexity dual-frequency Doppler radar and the basic algorithm for detecting moving targets behind barriers is present briefly. After analyzing the main characteristics of the algorithm, A ARMA (Auto-Regressive Moving Average) model is introduced to improve the poor resolution which is one of the main drawbacks of the traditional Doppler radars. Simulate the imaging results, including both the traditional algorithm and the ARMA-based algorithm circumstance. Comparing the results, the efficiency and the priority of the new algorithm is proved.

Key words [through-the-wall detecting](#) [Doppler radar](#) [Auto-Regressive Moving Average \(ARMA\) model](#) [spectrogram seperating](#) [Levinson recursion](#)

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