

基于复数据经验模式分解的天波超视距雷达瞬态干扰抑制

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Transient Interference Suppression Based on Complex Empirical Mode Decomposition in Over-The-Horizon Radar

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摘要

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摘要 针对目前大多数瞬态干扰抑制方法需要先抑制海(地)杂波, 计算复杂度高等问题, 该文提出了一种基于复数据经验模式分解(CEMD)的天波超视距雷达瞬态干扰抑制方法。该方法在CEMD分解雷达回波信号后, 同时完成瞬态干扰的检测、挖除和数据重构。它的主要优点是无需抑制杂波, 也不需要通过自回归(AR)模型预测恢复数据, 运算量小, 实用性强。实测数据处理结果表明: 该方法可以有效地抑制瞬态干扰。

关键词: 天波超视距雷达(OTHR) 复数据经验模式分解(CEMD) 瞬态干扰 干扰抑制

Abstract: Existing methods for suppressing transient interference suffer from high computation cost due to that most of them rely on clutter suppression. To solve this problem, a novel method based on Complex Empirical Mode Decomposition (CEMD) is proposed to suppress transient interference in Over-The-Horizon Radar (OTHR). After decomposed radar echoes by using CEMD it accomplishes the detection of transient interference, excision of transient interference, and data reconstruction at the same time. The proposed method does neither require to perform clutter suppression, nor to reconstruct data by using prediction algorithm of AutoRegressive (AR) model. Thus, this method is of low complexity and high feasibility. Processing of the real data from OTHR system shows that the algorithm can efficiently suppress transient interferences.

Keywords: Over-The-Horizon Radar (OTHR) Complex Empirical Mode Decomposition (CEMD) Transient interference Interference suppression

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