

论文

## 超宽带SAR未爆物特征提取新方法

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摘要

超宽带合成孔径雷达(UWB SAR)能够探测浅埋未爆物(UXO),而提取特征的有效性直接决定了检测性能。传统子带-子孔径处理在提取UXO散射函数关于频率和方位信息的同时牺牲了空间分辨率。针对这个问题,该文提出了基于空间-波数分布的频率和方位特征提取方法,并结合不变矩得到具有平移和旋转不变的特征集。该特征集不仅包含了频率和方位信息,而且包含了空间高分辨信息。实测数据处理表明,该文提出的特征能够有效提高UXO检测性能。

关键词 [合成孔径雷达](#) [超宽带](#) [未爆物](#) [空间-波数分布](#) [不变矩](#)

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## A Novel Feature Extraction Method for Unexploded Ordnance in Ultra-Wideband SAR

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Abstract

Ultra-WideBand Synthetic Aperture Radar (UWB SAR) can detect shallow buried Unexploded Ordnance (UXO), where the efficiency of extracted features determines the detection performance. The traditional subband-subaperture processing extracts the frequency and aspect information of UXO scattering with sacrifice of spatial resolutions. According to the issue, in this paper, the frequency and aspect angle features extraction method is proposed on the Space-Wavenumber Distribution (SWD), which is combined with the moment invariants to obtain the shift- and rotation-invariant feature set. The proposed feature set contains not only the frequency and aspect information but also high spatial resolutions information. Field data processing results show that the proposed features in this paper can improve the UXO detection performance efficiently.

Key words [Synthetic Aperture Radar \(SAR\)](#) [Ultra-wideband](#) [Unexploded Ordnance \(UXO\)](#) [Space-Wavenumber Distribution \(SWD\)](#) [Moment invariants](#)

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