

基于修正SSIM的SAR干扰效果评估方法

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Evaluation of Jamming Effect on SAR Based on Method of Modified Structural Similarity

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摘要

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摘要 该文提出了一种基于修正结构相似度的合成孔径雷达干扰效果评估方法。该方法不仅巧妙地利用了结构相似度作为主客观评价的连接纽带,而且结合梯度模与人眼视觉系统多通道特性相匹配的特点,通过非线性处理得到了修正的评估指标GSSIM。仿真结果表明,GSSIM较均方误差、峰值信噪比及相关系数等传统评估指标具有明显的优势,不仅能够更好地反映出干扰对图像ROI的影响,而且能够与人类视觉系统保持高度一致,进一步提升了整套评估系统的效率和准确率。

关键词: 合成孔径雷达 评估方法 干扰效果 修正结构相似度

Abstract: In this paper, an evaluation method based on modified structure similarity of jamming effects on synthetic aperture radar is proposed. This method can not only make good use of structure similarity as juncture between the subjective and the objective evaluation methods, but also utilize the character of gradient modulus which matches with the human vision system's multichannel model, eventually, the modified evaluation index named GSSIM (Gradient Structural SIMilarity) is obtained by nonlinear combination. Simulation results show that GSSIM has an obvious advantage over traditional evaluation indexes, such as MSE, PSNR, Correlation and so on. Besides reflecting the influences of jamming on Region Of Interest (ROI) in the image, it can keep identical to Human Vision System (HVS), and furthermore, it improves the efficiency and accuracy of entire evaluation system.

Keywords: SAR Evaluation methods Jamming effect Modified structural similarity

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