

SAR系统分辨率对景象匹配概率的影响

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The Influence of SAR System Resolution to the Probability of Scene Matching

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摘要

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摘要 该文阐述了SAR系统分辨率对图像功率谱的影响。基于负指数函数模型，对SAR图像1维周向功率谱进行了理论建模，推导出匹配信噪比与系统分辨率之间的关系。从自相关函数方面入手，推导出SAR系统分辨率与独立像元数的理论关系公式，进而分析了SAR系统分辨率对图像独立像元数的影响。最终建立了SAR系统参数与匹配概率之间的联系。通过仿真分析及真实SAR图像的试验，结果表明：该理论模型可以很好地描述SAR系统分辨率与匹配信噪比和图像独立像元数之间的关系，为基于SAR的景象匹配自主导航系统的参数设计提供理论基础。

关键词： 合成孔径雷达 景象匹配 正确匹配概率 匹配信噪比 独立像元数

Abstract: The influence of SAR system resolution to the image power spectrum density is represented. The one-dimensional circular power spectrum of SAR image is modeled based on negative exponent function and the relationship between the SNR of scene matching and the system resolution is deduced. The equations of SAR system resolution and independent pixel number are deduced from the autocorrelation function. The impact of SAR resolution to the independent number is analyzed in theory. Finally the relationship between SAR system parameters and acquisition probability is established. The simulation and experiment show that the model could describe the relationship among the SAR system resolution and the SNR of scene matching and the image independent pixel number very well. It provides the theoretical basis for the parameter design of scene matching trimble autopilot based on SAR.

Keywords: SAR Scene matching Acquisition probability SNR of scene matching Independent pixel number

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