

### 基于双变量模型和非下采样Contourlet变换的SAR图像相干斑抑制

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### SAR Image Despeckling Based on Bivariate Threshold Function in NSCT Domain

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摘要

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**摘要** 该文根据非下采样Contourlet分解系数与其父系数之间的相关性, 给出非高斯双变量分布模型, 应用贝叶斯估值理论推导出该模型相应的非线性双变量阈值函数。综合SAR图像非对数加性模型和双变量阈值函数, 提出基于双变量模型的非下采样Contourlet变换域SAR图像相干斑抑制方法(SNSCTBI)。实验通过对幅度格式和强度格式的SAR图像做相干斑抑制, 结果表明该文算法很好地保持了原始图像的辐射特性, 有效抑制了同质区域的相干斑, 同时边缘等纹理信息保持清晰。

**关键词:** SAR图像抑斑 非下采样Contourlet变换 Bayesian估计

**Abstract:** Considering the dependencies between the coefficients of Contourlet transform and their parents' coefficients, a non-Gaussian bivariate distribution is given, and corresponding nonlinear threshold function is derived from the model using Bayesian estimation theory. Combined nonlogarithmic additive model of SAR image with bivariate threshold function, a novel SAR image despeckling based on bivariate threshold function in Non-Subsampled Contourlet Transform domain (NSCT) is proposed. Experimental results for speckle reduction on amplitude and intensity of SAR images demonstrate that the method holds a good ability of radiometric preservation, the speckle is despeckled well in homogeneous regions, edges and textures of despeckled image are also clear.

**Keywords:** SAR image despeckling Non-Subsampled Contourlet Transform (NSCT) Bayesian estimation

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