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## Noise Filtering of Remotely Sensed I mages using I terative Thresholding of Wavelet and Curvelet Transforms

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Keywords: Multi-resolution analysis, wavelet transform, curvelet transform, additive noise, noise filtering, fixed thresholding, iterative thresholding

Abstract. This article presents techniques for noise filtering of remotely sensed images based on Multi-resolution Analysis (MRA). Multiresolution techniques provide a coarse-to-fine and scale-invariant decomposition of images for image interpretation. The multiresolution image analysis methods have the ability to analyze the image in an adaptive manner, capturing local information as well as global information. Further, noise being one of the biggest problems in image analysis and interpretation for further processing, is effectively handled by multi-resolution methods. The paper aims at the analysis of noise filtering of image using wavelets and curvelets on high resolution multispectral images

acquired by the Quickbird and medium resolution Landsat Thematic Mapper satellite systems. To improve the performance of noise filtering an iterative thresholding scheme for wavelets and curvelets is proposed for restoring the image from its noisy version. Two comparative measures are used for evaluation of the performance of the methods for denoising. One of them is the signal to noise ratio and the second is the ability of the noise filtering scheme to preserve the sharpness of the edges. By both of these comparative measures, the curvelet with iterative threshold has proved to be better than the others. Results are illustrated using Quickbird and Landsat images for fixed and iterative

thresholding.

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