

## Quality assessment by region in spot images fused by means dual-tree complex wavelet transform

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### Abstract

This work is motivated in providing and evaluating a fusion algorithm of remotely sensed images, i.e. the fusion of a high spatial resolution panchromatic image with a multi-spectral image (also known as pansharpening) using the dual-tree complex wavelet transform (DT-CWT), an effective approach for conducting an analytic and oversampled wavelet transform to reduce aliasing, and in turn reduce shift dependence of the wavelet transform. The proposed scheme includes the definition of a model to establish how information will be extracted from the PAN band and how that information will be injected into the MS bands with low spatial resolution. The approach was applied to Spot 5 images where there are bands falling outside PAN's spectrum. We propose an optional step in the quality evaluation protocol, which is to study the quality of the merger by regions, where each region represents a specific feature of the image. The results show that DT-CWT based approach offers good spatial quality while retaining the spectral information of original images, case SPOT 5. The additional step facilitates the identification of the most affected regions by the fusion process.

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### Keywords

Spot image Image fusion DT-CWT Pansharpening Quality assessment

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