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## Continuous wavelet transform for improving resolution of overlapped bands

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### Abstract

In this paper we consider a numerical differentiation algorithm based on the continuous wavelet transform for improving resolution of composite spectra. This approach provides the best contrast in differential curves compared to the conventional derivative spectrometry. A main merit is that the wavelet-based technique gives stable estimations of derivative without using the regularization, on the other hand, it does not make peak shifts. A comparative study of conventional derivative spectrometry based on the statistical regularization method and wavelet-based derivative spectrometry is made. Examples of the application of these for improving resolution of synthetic composite bands and real-world composite ones coming from molecular spectroscopy are given.

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### Keywords

Continuous wavelet transform, Derivative spectrometry, Resolution enhancement