

[Daubechies, Ingrid](#)

Wavelet transforms and orthonormal wavelet bases. (English) [Zbl 0802.42025](#)

Daubechies, Ingrid (ed.), Different perspectives on wavelets. American Mathematical Society short course on wavelets and applications, held in San Antonio, TX (USA), January 11-12, 1993. Providence, RI: American Mathematical Society. Proc. Symp. Appl. Math. 47, 1-33 (1993).

The paper offers an excellent introduction for anybody interested in wavelet transforms and their potential for various applications in signal processing.

The paper starts with a comparison of time-frequency localization properties of wavelet vs. windowed Fourier transform. A description of the main ideas of frames, multi-scale analysis and the resulting fast discrete wavelet transform follows. The authoress reviews construction techniques for different wavelet families with an emphasis on orthogonal wavelets.

Of course, a short paper cannot adequately indicate the full scope of wavelet theory and its potential for applications. This paper however invokes the flavour of wavelet analysis covering such diverse areas as the characterization of function spaces (by the decay rate of wavelet coefficients) and the explicit description of algorithms.

For the entire collection see [\[Zbl 0782.00059\]](#).

Reviewer: [P.Maaß \(Saarbrücken\)](#)

MSC:

- [42C40](#) Nontrigonometric harmonic analysis involving wavelets and other special systems
- [94A12](#) Signal theory (characterization, reconstruction, filtering, etc.)
- [46E15](#) Banach spaces of continuous, differentiable or analytic functions
- [41A15](#) Spline approximation
- [46B15](#) Summability and bases; functional analytic aspects of frames in Banach and Hilbert spaces

Cited in **4** Documents

Keywords:

[wavelet transforms](#); [windowed Fourier transform](#); [frames](#); [multi-scale analysis](#)