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# Wavelet transforms and their applications to MHD and plasma turbulence: a review



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## Abstract

Wavelet analysis and compression tools are reviewed and different applications for the study of MHD and plasma turbulence are presented. We introduce the continuous and the orthogonal wavelet transform and detail several statistical diagnostics based on the wavelet coefficients. We then show how to extract coherent structures out of fully developed turbulent flows using wavelet-based denoising. Finally some multiscale numerical simulation schemes using wavelets are described. Several examples for analysing, compressing and computing one-, two- and three-dimensional turbulent MHD or plasma flows are presented.

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