

paper TH/P1-7

Quantifying self-organization in magnetically confined fusion plasmas

**Highlights:**

A method for quantifying complexity and self-organization is presented which simultaneously determines the optimal wavelet for the analysis of temporal, spatio-temporal or higher dimensional data.

The method is particularly convenient for analyzing fluid and plasma turbulence.

The method is efficient in extracting coherent structures in turbulent plasmas.

A concept of *Complexity cascade* is introduced in analogy with the energy and enstrophy cascades.

The method may be used for predicting the emergence of new patterns and structures in plasma dynamics.

We show that self-organization is directly related to the continual growth of complexity over time and across scales.