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**Multiscale Sample Entropy of 2D Decaying Turbulence** ILDOO

KIM, University of Pittsburgh, MATTHEW SHTRAHMAN, Western Pennsylvania Hospital, XIAO-LUN WU, University of Pittsburgh — Kolmogorov-Sinai entropy has been used to quantify degrees of complexity of spatiotemporally chaotic systems. However, it is not always convenient to implement in real experiments. Recently a Multiscale Sample Entropy (MSE) measure has been proposed, which allows easier analyses of time series. In this study, we have generated decaying turbulence in a two-dimensional soap film and have measured velocity fluctuations as functions of time and downstream distance using a laser Doppler velocimeter. We performed MSE analysis and found there is a time scale  $\tau_0$  at which the MSE is maximized. The value of  $\tau_0$ , which correlates well with the large-eddy turn-over time, gets larger as turbulence decays. Other aspects of 2D turbulence are also analyzed using the velocity time series.

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