Abstract Submitted
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Identification of chaotic and stochastic processes by permutation entropy analysis[1] J.E. MAGGS, G.J. MORALES, UCLA — The dynamical nature of time signals can be determined by the simultaneous use of entropy and statistical complexity [O. A. Rosso, *et al.*, *Phys. Rev. Lett.* 99 154102 (2007)]. These key measures can be implemented using the amplitude permutation probability introduced by Bandt and Pompe [C. Bandt and B. Pompe, *Phys. Rev. Lett.*, 88 174102 (2002)]. Stochastic and chaotic processes are distinguished because they occupy different regions of the entropy-complexity plane. Permutation entropy analysis is used to demonstrate that temperature fluctuations observed in a basic heat transport experiment arise from chaotic dynamics [J. E. Maggs and G. J. Morales, *Plasma Phys. and Control. Fusion*, 55 085015 (2013)]. Locations of various known stochastic and chaotic processes in the entropy-complexity plane are presented and the important technique of 'sub-sampling' for the amelioration of noise is discussed. The permutation entropy analysis can be applied to any time signal as no pre-processing or *a priori* conditions are required. This signal analysis technique has the potential to uncover new features in a wide range of fusion and basic plasma experiments.

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