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**Statistical properties of electrostatic turbulence XGC1 data**[1]
VARUN TANGRI, T. RAFIQ, A.H. KRITZ, Lehigh U., SEUNG-HOE KU, JIANYING LANG, C.S. CHANG, Princeton Plasma Physics Laboratory, J. SEO, Korea Advanced Institute of Science and Technology, EPSI TEAM — Statistical properties of data from electrostatic ITG turbulence in gyrokinetic XGC1 simulations are examined for evidence of Self-Organized Criticality and intermittency in order to develop a better understanding of the dynamics of edge and core turbulence. The following quantities are computed at various radial locations: a) Speed of inward and outward propagating fronts; b) Non-Gaussian Distribution count; c) Fraction of total ion heat flux above a chosen base value; d) Power spectrum; e) Hurst parameter using both R/S and Aggregate Variance methods; and f) Skewness and kurtosis. These results are obtained using turbulence intensity, ion heat flux and temperature fluctuation data. Propagating fronts (avalanches) are observed to be moving with the speed of a few hundred m/s. High skewness and kurtosis are observed at some radial locations. The relation of Gaussian curvature to non-Gaussian nature of turbulence in XGC1 data is investigated. Turbulence intensity flux distribution with a long left tail is observed when turbulence intensity flux fluctuation is negative. This shows a small number of 'rare' events carry a "burst" of turbulence intensity inward. The relation between inward propagation of turbulent intensity and opening and closing of zonal flows will be elucidated.

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