

Abstract Submitted  
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**Remarks on the Scaling of Kurtosis with Squared Skewness**<sup>1</sup> J.A. KROMMES, Princeton University — Recent analysis of density fluctuations in TORPEX<sup>2</sup> support the relationship  $K = aS^2 + b$  between the skewness  $S$  and (excess) kurtosis  $K$ , where  $a \approx 1.5$  and  $b \approx -0.2$ . (A realizability constraint is  $K \geq S^2 - 2$ .) Remarkably, essentially the same result has been shown to hold for a global dataset of fluctuations of sea-surface temperature,<sup>3</sup> and a simple theoretical (nonlinear Langevin) model has been proposed<sup>3</sup> that leads to  $a = 3/2$  and  $b = 0$ . This is obviously suggestive, but it is a challenge to justify the Langevin model in detail for magnetized plasma turbulence. Previous results on higher-order statistics,<sup>4</sup> dimensionally compatible with  $K \sim S^2$ , are reviewed and an attempt is made to derive  $a$  and  $b$  for a model involving coupled modes and linear waves. The extent to which the values of  $a$  and  $b$  are sensitive discriminants for details of the underlying turbulence is discussed.

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<sup>2</sup>B. Labit *et al.*, Universal statistical properties of drift-interchange turbulence in TORPEX plasmas, Phys. Rev. Lett. **98**, 255002 (2007).

<sup>3</sup>P. Sura and P. D. Sardeshmukh, A global view of non-Gaussian SST variability, J. Phys. Oceanogr.(2007), in press.

<sup>4</sup>J. A. Krommes, Non-Gaussian statistics, classical field theory, and realizable Langevin models, Phys. Rev. E **53**, 4865 (1996).

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