Remarks on the Scaling of Kurtosis with Squared Skewness\textsuperscript{1} J.A. KROMMES, Princeton University — Recent analysis of density fluctuations in TORPEX\textsuperscript{2} 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,\textsuperscript{3} and a simple theoretical (nonlinear Langevin) model has been proposed\textsuperscript{3} 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,\textsuperscript{4} 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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\textsuperscript{3}P. Sura and P. D. Sardeshmukh, A global view of non-Gaussian SST variability, J. Phys. Oceanogr. (2007), in press.