

Abstract Submitted  
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**Intermittency in an ensemble of Gaussian velocity fields with fluctuating characteristic scales** LAURA J. LUKASSEN, MICHAEL WILCZEK, Max Planck Institute for Dynamics and Self-Organization, Goettingen — Turbulent velocity fluctuations exhibit intermittent behavior in both, the Lagrangian and the Eulerian description. Probability density functions of Lagrangian velocity increments, e.g., show a transition from a nearly Gaussian shape for large time lags to highly non-Gaussian shapes for smaller time lags. This inherent non-Gaussianity poses a challenge for both, phenomenological descriptions of turbulence as well as statistical approaches suffering from the closure problem. Here, we discuss the properties of an ensemble of Gaussian velocity fields in which the characteristic time (or length) scales of the ensemble members are drawn from an underlying distribution of those scales. Such an ensemble naturally exhibits non-Gaussian statistics, as has been demonstrated, e.g., in the context of multifractal modeling or superstatistics. In order to provide a more general approach, our model is based on the characteristic functional. Consequently, it captures the complete statistical information of the ensemble and thus, additional information such as joint statistics of increments at various scales can be obtained. In this context, we will discuss the potential of formulating novel closures based on our method as well as its relation to existing phenomenological models of turbulence.

Laura J. Lukassen  
Max Planck Institute for Dynamics and Self-Organization, Goettingen

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