Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

Development of non-Gaussian statistics in rotating turbulence YI LI, University of Sheffield — The short-time evolution of non-Gaussian statistics in rotating turbulence is studied. Generalizing the idea in Y. Li and C. Meneveau, Phys. Rev. Lett. 95, 164502 (2005), dynamical equations for the velocity increments defined over an evolving material line element are obtained in a Lagrangian coordinate frame defined by the directions of the line element and the rotation axis. The equations provide simple representation for the effects of nonlinear advection and the Coriolis force. From these equations, we show that several observations in rotating turbulence, including the development of two-dimensional three-componential state and the positive skewness in cyclonic vorticity, can be qualitatively explained by the interaction between the Coriolis force and elementary nonlinear self-interaction processes.

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Date submitted: 04 Aug 2008 Electronic form version 1.4