Abstract Submitted
for the DFD08 Meeting of
The American Physical Society

**Intermittency and scale dependent statistics in fully developed turbulence** KATSUNORI YOSHIMATSU, NAOYA OKAMOTO, Department of Computational Science and Engineering, Nagoya University, Nagoya, Japan, KAI SCHNEIDER, M2P2-CNRS & CMI, Aix-Marseille University, Marseille, France, YUKIO KANEDA, Department of Computational Science and Engineering, Nagoya University, Nagoya, Japan, MARIE FARGE, LMD-IPSL-CNRS, Ecole Normale Superieure, Paris, France — We compare high resolution DNS data of isotropic turbulence computed at resolution $2048^3$ with incompressible Gaussian random fields having the same energy spectrum and, either the same helicity distribution as the DNS data, or vanishing helicity. The flatness of velocity increases with scale for the turbulent but not the random fields. A new measure, the scale dependent relative helicity, quantifies the geometrical statistics of the flow at different scales and shows that only the turbulent flow is intermittent and helical. Scale dependent statistical analyses of Eulerian and Lagrangian accelerations show significant differences and hence confirm the inherently different dynamics of turbulent and random flows.

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Date submitted: 08 Sep 2008 Electronic form version 1.4