

Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Bridging from Eulerian to Lagrangian statistics in turbulent flows

OLIVER KAMPS, Center for Nonlinear Science, University of Muenster, RUDOLF FRIEDRICH, Institute for Theoretical Physics, University of Muenster, HOLGER HOMANN, RAINER GRAUER, Institut fuer Theoretische Physik I, Ruhr-Universitaet Bochum — The problem of relating Lagrangian and Eulerian statistics is a long standing problem in basic and applied turbulence research. Motivated by the investigation of Lagrangian statistics in the inverse cascade regime of 2D turbulence and in fully developed 3D Turbulence we adress the question of relating Lagrangian and Eulerian velocity increment statistics. It turns out that a formal connection between both frames of reference can be established via transition probabilities, which can be estimated from numerical simulations. We also focus on the validity of Corrsin's independence hypothesis in the context of 2D and 3D flows which is of general interest for turbulent transport and mixing processes.

Oliver Kamps
Center for Nonlinear Science, University of Muenster

Date submitted: 24 Jul 2009

Electronic form version 1.4