

Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

Momentum transport and dissipation scaling in turbulent shear flows BRUNO ECKHARDT, SIEGFRIED GROSSMANN, Philipps-Universitaet Marburg, DETLEF LOHSE, University of Twente — We expose analogies between turbulence in a fluid heated from below (Rayleigh-Benard flow), in a fluid between rotating cylinders (Taylor-Couette flow) and in pressure driven flow down a pipe. The analogy is based on the identification of heat and momentum fluxes, respectively, and on corresponding dissipation rates. With this identification it becomes possible to transfer the scaling and modelling ideas of Grossmann and Lohse from Rayleigh-Benard to shear flows. The model is consistent with data for turbulent Taylor-Couette and pipe flow, and gives testable predictions for the dependence on gap widths.

Bruno Eckhardt
Philipps-Universitaet Marburg

Date submitted: 15 Aug 2006

Electronic form version 1.4