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Radu Dascaliuc* (rdascal@indiana.edu), Department of Mathematics, Indiana University, Bloomington, IN 47405, and **Ciprian Foias** and **Michael S. Jolly**. *Behavior of the average energy, enstrophy and palinstrophy of the 2D turbulent flows with high Grashof numbers.*

Our rigorous study of the ensemble averages of the 2D turbulent flows modelled by the Navier-Stokes equations shows that the average energy and enstrophy must be (up to a logarithmic correction) of order $O(Gr)$ while the average palinstrophy of order $O(Gr^{3/2})$, where Gr is the Grashof number. We discuss the implications to the strength of energy and enstrophy cascades as well as the behavior of the inertial term of the Navier-Stokes equations for turbulent flows. (Received August 14, 2007)