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*Irregular transport and enstrophy dissipation in 2D incompressible flows.*

We study the transport and dissipation of enstrophy in 2D incompressible flows. Enstrophy is half the space integral of vorticity squared, and it is a relevant quantity in 2D turbulence. We consider initial data with vorticity in  $L^2$  and its logarithmic refinements and study exact transport of enstrophy by the velocity field. We also consider data in the larger Besov space  $B_{2,\infty}^0$  and study the existence of well-defined enstrophy defects, measuring the rate of enstrophy dissipation. (Received February 05, 2006)