INVISCID LIMIT FOR DAMPED AND DRIVEN INCOMPRESSIBLE NAVIER-STOKES EQUATIONS IN $\mathbb{R}^2$

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We consider the zero viscosity limit of long time averages of solutions of damped and driven Navier-Stokes equations in $\mathbb{R}^2$. These equations arise in the Charney-Stommel model of the Gulf Stream, [1]. The fact there is no anomalous dissipation of energy in damped and driven Navier-Stokes equations was suggested by D. Bernard, [2]. We prove that the zero viscosity limit of long time average enstrophy dissipation rate vanishes. Stationary statistical solutions of the damped and driven Navier-Stokes equations converge to renormalized stationary statistical solutions of the damped and driven Euler equations. These solutions obey the enstrophy balance and are inspired by the work of DiPerna and Lions, [4]. This talk is based on a joint work with Peter Constantin, [3].

References

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