Abstract Submitted
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Energy cascade and irreversibility in reversible shell models of turbulence[1] MASSIMO DE PIETRO, University of Roma Tor Vergata, MASSIMO CENCINI, Institute of Complex Systems-CNR, Rome, LUCA BIFERALE, University of Roma Tor Vergata, GUIDO BOFFETTA, University of Torino — Dissipation breaks the time reversibility of the Navier-Stokes equation. It has been conjectured that forced-dissipated Navier-Stokes equations are equivalent to a modified version of the equations in which the dissipative term is modified such as to preserve the time-inversion symmetry. This can be realized choosing a velocity dependent viscosity in such a way to preserve a global quantity, e.g. energy or enstrophy. Here we present results on shell models of turbulence where time reversibility is restored following the mechanism originally suggested. We show that when the time-dependent viscosity is chosen such as to conserve enstrophy, the resulting reversible dynamics exhibit an energy cascade, sharing the same features of the standard irreversible cascade.

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