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Inverse energy cascade in non-local helical shell-models of turbulence[1] DE PIETRO MASSIMO, LUCA BIFERALE, GANAPATI SAHOO, University of Rome "Tor Vergata," Rome, Italy, ALEXEI MAILYBAEV, Instituto Nacional de Matematica Pura e Aplicada-IMPA, Rio de Janeiro, Brazil — Following the exact decomposition in eigenstates of helicity for the Navier-Stokes equations in Fourier space we introduce a modified version of helical shell-models for turbulence with non-local triadic interactions. By using both analytical argument and numerical simulation we show that there exists a sub-class of models with elongated shell interactions that exhibits a statistically stable inverse energy cascade. Using also data from direct numerical simulations of helical Navier-Stokes equations we further support the idea that energy transfer mechanism in fully developed turbulence is the result of a strong entanglement among different triadic interactions possessing different transfer mechanisms.

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