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Spatial structure of spectral transport in two-dimensional flow[1]
YANG LIAO, NICHOLAS OUELLETTE, Yale University — Recently developed tools based on filtering have begun to allow the spatial localization of spectral activity in turbulent flow. These filter-space techniques (FSTs) have been used, for example, to study the mechanisms responsible for the double cascade in two-dimensional turbulence or the coherence of the spectral energy flux along Lagrangian trajectories. But FSTs can sometimes give results that seem potentially spurious, such as very large signals around vortex cores. Using both a simple analytical model flow field and measurements from a quasi-two-dimensional experimental flow, we study the results of FSTs in detail. In particular, we show that a classic decomposition of the spectral energy flux may be fruitful.

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Yang Liao
Yale University

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