Abstract Submitted for the DFD17 Meeting of The American Physical Society

From 2D to 3D turbulence through 2D3C configurations¹ MICHELE BUZZICOTTI, LUCA BIFERALE, MORITZ LINKMANN, Department of Physics and INFN, University of Rome Tor Vergata — We study analytically and numerically the geometry of the nonlinear interactions and the resulting energy transfer directions of 2D3C flows. Through a set of suitably designed Direct Numerical Simulations we also study the coupling between several 2D3C flows, where we explore the transition between 2D and fully 3D turbulence. In particular, we find that the coupling of three 2D3C flows on mutually orthogonal planes subject to small-scale forcing leads to a stationary 3D out-of-equilibrium dynamics at the energy containing scales where the inverse cascade is directly balanced by a forward cascade carried by a different subsets of interactions [L. Biferale et al, Physics of Fluids 29, 111101 (2017)].

¹ERC AdG Grant No 339032 NewTURB

Michele Buzzicotti Department of Physics INFN, University of Rome Tor Vergata

Date submitted: 26 Jul 2017

Electronic form version 1.4