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**Asymptotic stability of spectral-based PDF modeling for homogeneous turbulent flows** ALEJANDRO CAMPOS, Stanford University, KARTHIK DURAISAMY, University of Michigan Ann Arbor, GIANLUCA IACCARINO, Stanford University — Engineering models of turbulence, based on one-point statistics, neglect spectral information inherent in a turbulence field. It is well known, however, that the evolution of turbulence is dictated by a complex interplay between the spectral modes of velocity. For example, for homogeneous turbulence, the pressure-rate-of-strain depends on the integrated energy spectrum weighted by components of the wave vectors. The Interacting Particle Representation Model (IPRM) (Kassinos & Reynolds, 1996) and the Velocity/Wave-Vector PDF model (Van Slooten & Pope, 1997) emulate spectral information in an attempt to improve the modeling of turbulence. We investigate the evolution and asymptotic stability of the IPRM using three different approaches. The first approach considers the Lagrangian evolution of individual realizations (idealized as particles) of the stochastic process defined by the IPRM. The second solves Lagrangian evolution equations for clusters of realizations conditional on a given wave vector. The third evolves the solution of the Eulerian conditional PDF corresponding to the aforementioned clusters. This last method avoids issues related to discrete particle noise and slow convergence associated with Lagrangian particle-based simulations.

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