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The effect of turbulence in core-collapse supernovae. JORDI CASANOVA, Oak Ridge National Lab — While it is widely accepted that a neutrino-driven mechanism plays a major role in the onset of the explosion, the nature of it is not fully understood. Recent multi-dimensional studies reveal that the growth of fluid instabilities, combined with the development of convection, will contribute to the morphology of the explosion. We utilize the advanced CHIMERA code, capable to model multi-dimensional simulations of core-collapse supernovae, to study the interplay between turbulence and the dynamics of the explosion. The CHIMERA code is a parallel, multi-physics code, that includes sophisticated nuclear physics and spectral neutrino transport. We have performed a set of wedge simulations (that is, a 90 degree shaped computational domain), for resolutions that vary from a quarter to two degrees. We will present a detailed analysis of the development of turbulence in function of the resolution in two and three dimensions, and will discuss the connection with the progress of the explosion.

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