Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

2D Spinodal Decomposition in Forced Turbulence XIANG FAN, PATRICK DIAMOND, Univ of California - San Diego, LUIS CHACON, HUI LI, Los Alamos National Laboratory — Spinodal decomposition is a second order phase transition for binary fluid mixture, from one thermodynamic phase to form two co-existing phases. The governing equation for this coarsening process below critical temperature, Cahn-Hilliard Equation, is very similar to 2D MHD Equation, especially the conserved quantities have a close correspondence between each other, so theories for MHD turbulence are used to study spinodal decomposition in forced turbulence. Domain size is increased with time along with the inverse cascade, and the length scale can be arrested by a forced turbulence with direct cascade [1]. The two competing mechanisms lead to a stabilized domain size length scale, which can be characterized by Hinze Scale. The 2D spinodal decomposition in forced turbulence is studied by both theory and simulation with "pixie2d." This work focuses on the relation between Hinze scale and spectra and cascades. Similarities and differences between spinodal decomposition and MHD are investigated. Also some transport properties are studied following MHD theories. This work is supported by the Department of Energy under Award Number DE-FG02-04ER54738.

[1] Perlekar, et al. Physical Review Letters 112.1 (2014): 014502.

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Date submitted: 20 Jul 2015 Electronic form version 1.4