Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Characterization of magnetic dynamos driven by non-Gaussian, correlated velocity fluctuations R. SANCHEZ, Universidad Carlos III de Madrid, D. E. NEWMAN, University of Alaska at Fairbanks, J.M. REYNOLDS-BARREDO, Universidad Carlos III de Madrid — The generation of magnetic dynamos by turbulent fluctuations with non-Gaussian, non-Markovian features has been studied by means of meshless, Lagrangian numerical schemes inspired in those of Smoothed-Particle Hydrodynamics. The power of this numerical approach has allowed us to fully characterize the dynamo generation over a wide range of values of the exponents that characterize the statistics and correlation of the turbulent fluctuations. In particular, the tail exponent of the probability density function of the velocity fluctuations, α, and the Hurst exponent H of the turbulent velocity along its Lagrangian trajectories. Our numerical results indicate that, over some significant exponent ranges, magnetic dynamo generation is observed in spite of the absence of any mean flow helicity, which is in contrast to what is expected in the more traditional Gaussian, Markovian case.

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Date submitted: 08 Jul 2016 Electronic form version 1.4