Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Heat wave propagation due to power modulation in stochastic magnetic fields DIEGO DEL-CASTILLO-NEGRETE, DAN BLAZEVSKI, Oak Ridge National Laboratory — Heat wave propagation due to power modulation in 3-dimensional chaotic magnetic fields is studied by solving the parallel heat transport equation using a Lagrangian-Green's function (LG) method [D. del-Castillo-Negrete et al., Phys. Rev. Letters 195004 (2011).] Going beyond previous works, we study time periodic sources using a novel Fourier-based numerical implementation of the LG method. The main problem addressed is the dependence of the heat wave propagation on the stochasticity (controlled by the amplitude of the magnetic field perturbation ϵ) and the inverse penetration length $\gamma = \sqrt{\omega/2\chi}$ (where χ is the parallel diffusivity and ω is the power modulation frequency). In all the cases considered there are no magnetic flux surfaces. However, radial transport is observed to depend strongly on ϵ and γ due to the presence of *partial transport barriers*. Regions where the magnetic field connection length is large, correlate with regions where the radial propagation of the heat waves slows down and where the wave amplitude exhibits a steep gradient. Preliminary applications to recent heat pulse propagation experiments in DIII-D are discussed.

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Date submitted: 24 Jul 2015 Electronic form version 1.4