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Heat pulse propagation is 3-D chaotic magnetic fields[1] D. DEL-CASTILLO-NEGRETE, Oak Ridge National Laboratory, USA, D. BLAZEVSKI, Institute for Mechanical Systems, ETH Zurich, Switzerland — Perturbative transport studies provide valuable time dependent information to construct and test transport models in magnetically confined plasmas. In these studies, the transient response of the plasma to externally applied small perturbations is followed in time. Here we present a numerical study of the radial propagation of edge heat pulse perturbations in the presence of 3-dimensional chaotic magnetic fields in cylindrical geometry. Based on the strong transport anisotropy encountered in magnetized plasmas ($\chi_\parallel/\chi_\perp \sim 10^{10}$ in fusion plasmas, where $\chi_\parallel$ and $\chi_\perp$ are the parallel and perpendicular conductivities) we limit attention to the extreme anisotropic, purely parallel, $\chi_\perp = 0$, case. Using the Lagrangian-Green's function method[2] we study the dependence of the pulse speed and radial penetration on the level of stochasticity of the magnetic field in regular, and reversed magnetic shear configurations. Of particular interest is the slowing down of the heat pulse due to weak chaos, islands, and shearless cantori.[3]

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[2]D. del-Castillo-Negrete and L. Chacon, Phys. Rev. Lett. **106** (2011); Phys. Plasmas **19**, 056112 (2012)
[3]D. Blazevski and D. del-Castillo-Negrete, Phys. Rev. E **87** 063106 (2013)

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