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Optimization of a GPU Field Line Integration Code for Tokamak Transprt Simulation,* A. Steinhebel, *College of Wooster*; T.E. Evans, W. Wu, *General Atomics* – A basic knowledge of transport and diffusion physics processes in fusion plasmas is essential for the understanding and optimization of fusion confinement devices. Classical transport theory disagrees with experiment in predictions of the time necessary for electrons to exit the plasma. This anomalous transport is not yet understood. The TRIP3DGPU code is used to incorporate realistic magnetic field perturbations and trace the resulting magnetic field lines. The more accurately these lines can be traced, the more precisely the electron position and time of diffusion can be calculated through a series of electron-ion collisions. Accurate line tracing requires a small computational spatial integration step that does not result in a long computation time. To meet wishes for accuracy and speed, a varied step will be introduced into TRIP3DGPU and tested. The goal is to allow for quick, accurate magnetic field line tracing which can then be used to compare electron transport simulations to theory and experiment.

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