

Abstract Submitted
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Current Status and Development Plans for the PSI-TET Code

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— The PSI-TET code is designed for MHD modeling on a tetrahedral mesh which can be quickly generated from a CAD representation of an arbitrary 3-dimensional geometry such as the HIT-SI spheromak experiment. It solves finite element equations using up to fourth order nodal Lagrange or vector Nedelec elements by fully implicit Newton-Krylov iteration with geometric and polynomial multigrid preconditioning. Physics modules currently exist for solving linearized ideal MHD, non-linear resistive MHD and non-linear resistive Hall MHD (without density or temperature evolution). Boundary conditions allow for an insulator coated conductor and external circuits that drive flux and current in multiply connected regions like the helicity injectors of HIT-SI. Another poster [C. J. Hansen et. al. (this meeting)] will present results from simulations of injector coupling and current drive in HIT-SI. This poster will describe features of the code and documentation currently available, and plans for further development in the near term. This will include the addition of density and temperature equations, neutral interactions, interactive circuits and a new user interface that will simplify the procedure for changing or adding equations.

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