Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

A Tetrahedral Mesh 3-D Ideal MHD Equilibrium Code GEORGE J. MARKLIN, CHRIS HANSEN, PSI Center, University of Washington, Seattle WA 98195 — A new code has been developed to solve the zero beta equilibrium equation mu0*J = curl(B) = Lambda*B on a tetrahedral mesh in an arbitrary 3-D geometry. The function Lambda(x) must be constant along field lines and on flux surfaces, but may be specified arbitrarily across surfaces, where surfaces exist. It must be spatially constant in ergodic regions where there are no surfaces. The solution is computed by alternately solving curl(B) = Lambda*B with Lambda specified, and then updating Lambda = Lambda(B) and iterating until converged. The first equation is easily solved using standard methods for computing Taylor states. The Lambda update is most easily accomplished by tracing field lines and attempting to find the q value, which is constant on a magnetic surface but generally does not exist for lines that do not lie on surfaces. Lambda may then be specified as a function of q where the q value exists, and constant where the q value does not exist. Examples will be presented of 3-D equilibria in HIT-SI for different ratios of spheromak current to injector current and injector flux.

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Date submitted: 20 Jul 2009 Electronic form version 1.4