

Abstract Submitted
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Magnetohydrodynamics in Hydra¹ J.M. KONING, G.D. KERBEL, M.M. MARINAK, Lawrence Livermore National Laboratory — The Magnetohydrodynamics package in the ALE radiation-hydrodynamics ICF design code Hydra is based upon a three-dimensional vector finite element method. This defines a set of spaces and differential operators that maintain the zero divergence of the magnetic field exactly. It is fully implicit in time and second order accurate in space. We discuss several improvements to the MHD package. The first addition is an anisotropic tensor based heat conduction method. The second improvement is a method for solving the magnetic diffusion equation for all of the element types resulting from point and line singularities including tetrahedral and pyramid elements. Finally a new magnetic flux advection method was implemented based on the method by A.C. Robinson, et al.²

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²A.C. Robinson, J. H. J. Niederhaus, V. G. Weirs, E. Love, *Int. J. Numer. Meth. Fluids*, 65, 1438 (2011)

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