

Abstract Submitted
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Benchmarking calculations of the magnetic field near the last closed flux surface with finite plasma pressure and current¹ J.C. SCHMITT, Auburn University, A. BADER, University of Wisconsin-Madison, M.R. CIANCIOSA, Oak Ridge National Laboratory, M. DREVLAK, Max-Planck-Institut für Plasmaphysik, H. FRERICHS, University of Wisconsin-Madison, S.A. LAZERSON, Princeton Plasma Physics Laboratory, J.D. LORE, Oak Ridge National Laboratory, D. MAURER, Auburn University — The calculation of the magnetic field near the last closed flux surface in the presence of finite plasma pressure and current is important because of its impact on subsequent calculations. Subtle differences in the calculation of the magnetic field results in different magnetic field line trajectories, which are subsequently used to generate a ‘field-aligned’ grids for edge transport and divertor modeling with the EMC3-EIRENE code. Two methods of field calculations are discussed. One uses the virtual casing (VC) theorem and the other uses the magnetic vector potential. The VC theorem is implemented in the DIAGNO and EXTENDER codes, while the BMW code uses the magnetic vector potential. For both methods, a plasma equilibrium provided by VMEC is provided. Differences in the magnetic field and subsequent calculations for W7-X configurations will be presented and discussed. This work will help determine the strategy on how best to pass reconstructed equilibrium information from V3FIT to EMC3/EIRENE.

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