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Edge Transport Modeling using the 3D EMC3-Eirene code on Tokamaks and Stellarators J.D. LORE, J.W. AHN, A. BRIESEMEISTER, ORNL, N. FERRARO, General Atomics, B. LABOMBARD, MIT, A. MCLEAN, LLNL, M. REINKE, M. SHAFER, ORNL, J. TERRY, MIT — The fluid plasma edge transport code EMC3-Eirene has been applied to aid data interpretation and understanding the results of experiments with 3D effects on several tokamaks. These include applied and intrinsic 3D magnetic fields, 3D plasma facing components, and toroidally and poloidally localized heat and particle sources. On Alcator C-Mod, a series of experiments explored the impact of toroidally and poloidally localized impurity gas injection on core confinement and asymmetries in the divertor fluxes, with the differences between the asymmetry in L-mode and H-mode qualitatively reproduced in the simulations due to changes in the impurity ionization in the private flux region. Modeling of NSTX experiments on the effect of 3D fields on detachment matched the trend of a higher density at which the detachment occurs when 3D fields are applied. On DIII-D, different magnetic field models were used in the simulation and compared against the 2D Thomson scattering diagnostic. In simulating each device different aspects of the code model are tested pointing to areas where the model must be further developed. The application to stellarator experiments will also be discussed. Work supported by U.S. DOE: DE-AC05-00OR22725, DE AC02-09CH11466, DE-FC02-99ER54512, and DE-FC02-04ER54698.

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