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TEQ Free Boundary Equilibrium Solver in TRANSP/PTRANSP[1] R. ANDRE, D. MCCUNE, PPPL, D. PEARLSTEIN, L. LODESTRO, W.H. MEYER, LLNL — The TRANSP code has traditionally been used to study the results of fusion tokamak experiments. In this mode of operation, the MHD equilibrium is reconstructed inside a prescribed boundary using inverse solvers such as VMEC and ESC. Accurate magnetic field values beyond the plasma boundary are not available. In the PTRANSP project, adding predictive capability to TRANSP, such limitations are overcome by using the free boundary direct solver of TEQ. With this, the poloidal flux on the full (R,Z) grid, the separatrix, and the coil currents can be self-consistently computed. The higher fidelity representation of the field is needed for neutral beam and RF models outside closed flux surfaces and for coupling to edge models. The availability of the TEQ direct solver will also enable options for improvement of the predictive Ohm's law model. This poster will describe the implementation of the TEQ direct solver in TRANSP/PTRANSP and the status of predictive modeling enhancements based thereon.

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