

Abstract Submitted  
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**Reconstructions of toroidal current profiles for bootstrap current discharges in Wendelstein 7-X.**<sup>1</sup> JOHN SCHMITT, D. MAURER, Auburn University, N. PABLANT, PPPL, T. ANDREEVA, J. GEIGER, S. LAZERSON, U. NEUNER, K. RAHBARNIA, J. SCHILLING, H. THOMSEN, Y. TURKIN, AND THE W7-X TEAM, Max-Planck-Institut für Plasmaphysik — The reconstruction of the Wendelstein 7-X (W7-X) plasma equilibrium plays an important role in interpreting diagnostic signals and understanding the plasma. The reconstruction is iterative in nature, involving the repeated calculation of the MHD equilibrium and synthetic diagnostic signals and comparing these signals to measured signals. The parameters that describe the equilibrium (shape and location of the plasma boundary and profile information) are adjusted between iterations to find the best-fit of the measured and synthetic signals. These profiles are then used to interpret diagnostic information and for further physics analysis. The predicted evolution of the current profile is compared to the reconstructions constrained by magnetic diagnostics, Thomson Scattering, interferometry, x-ray imaging crystal spectroscopy, and boundary conditions based on the proximity to the 5/5-island chain. The time-evolved current density profile, based on transport simulations of toroidal current using NTSS, is compared to reconstructions at several times during the bootstrap discharge. The sensitivity of the reconstruction to the current density profile and its parameterization and dependence on diagnostic constraints and initial profiles will be discussed.

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