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Extracting 3D Information from 1D and 2D Diagnostic Systems on the DIII-D Tokamak[1] MICHAEL BROOKMAN, Institute for Fusion Studies, University of Texas — The interpretation of tokamak data often hinges on assumptions of axisymetry and flux surface equilibria, neglecting 3D effects. This work discusses examples on the DIII-D tokamak where this assumption is an insufficient approximation, and explores the diagnostic information available to resolve 3D effects while preserving 1D profiles. Methods for extracting 3D data from the electron cyclotron emission radiometers, density profile reflectometer, and Thomson scattering system are discussed. Coordinating diagnostics around the tokamak shows the significance of 3D features, such as sawteeth[1] and resonant magnetic perturbations. A consequence of imposed 3D perturbations is a shift in major radius of measured profiles between diagnostics at different toroidal locations. Integrating different diagnostics requires a database containing information about their toroidal, poloidal, and radial locations. Through the data analysis framework OMFIT, it is possible to measure the magnitude of the apparent shifts from 3D effects and enforce consistency between diagnostics. Using the existing 1D and 2D diagnostic systems on DIII-D, this process allows the effects of the 3D perturbations on 1D profiles to be addressed.

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