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3D Equilibrium Reconstruction of Plasmas with Islands and Stochastic Regions¹ SAMUEL LAZERSON, DAVID GATES, DONALD MONTICELLO, HUTCH NEILSON, NEIL POMPHREY, ALLAN REIMAN, Princeton Plasma Physics Laboratory, SATORU SAKAKIBARA, YASUHIRO SUZUKI, National Institute for Fusion Science — Recent advances in computational speed and simulation codes have allowed the reconstruction of 3D fields with islands and stochastic regions from experimental data. The ability to reconstruct axisymmetric equilibria from various diagnostic measurements has become a cornerstone of data analysis in tokamaks. However, these codes cannot treat the 3D fields produced by RMP's or helical equilibrium structures present in modern Tokamaks. Building upon work to fit VMEC equilibria to W7AS measurements, the reconstruction effort was applied to the Large Helical Device (LHD). The PIES code relaxes the nested flux surface constraint of the VMEC reconstruction found with the PIES code. This allows for the presence of magnetic islands and stochastic regions. This allows for discussions of the effect of such features on magnetic diagnostics. Work is underway to fit PIES equilibria to measurements in DIII-D.

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Samuel Lazerson
Princeton Plasma Physics Laboratory

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