Abstract Submitted
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Edge Soft X-Ray Imaging for Measurements of Magnetic Topology During 3-D Magnetic Perturbations[1] M.W. SHAFER, E.A. UNTERBERG, D.J. BATTAGLIA, J.M. CANIK, J.H. HARRIS, D.L. HILLIS, R. MAINGI, ORNL, T.E. EVANS, GA — A new tangential 2D soft x-ray imaging system (SXRIS) was recently installed on DIII-D to directly measure the edge island structure in the X-point region. Measurements of island structure are needed to understand the plasma response during the application of resonant magnetic perturbations (RMPs). Modeling of inverted images indicates integration times $\geq$1 ms with accurate equilibrium reconstruction are needed for small island ($\leq$3 cm) detection. The total signal-to-noise ratio is estimated to be $\geq$100, which provides enough sensitivity to extract the estimated 1%-10% island perturbations from the total SXR emissivity. First data from the diagnostic will be shown from DIII-D discharges with 3D magnetic perturbations applied. Initial image inversions are shown to provide estimates of the island structure in these discharges. This structure is compared to synthetic diagnostic estimates using modeled 3D SXR emissivity in L-mode and H-mode.

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