

Abstract Submitted
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Sorting Category: 5.1.1.2 (Experimental)

Edge Current Density Determination Using Laser-Enhanced LIBEAM on DIII-D¹ D.M. THOMAS, K.H. BURRELL, P. GOHIL, General Atomics, R. JAYAKUMAR, D. NILSON, B.W. RICE, Lawrence Livermore National Laboratory — The specific structure of the edge current profile has profound effects on the stability and ultimate performance of many advanced tokamak (AT) modes. This is true for both bootstrap and externally driven currents used to tailor the edge shear. Absent a direct local measurement of $j(r)$, the best alternative is a determination of B_{pol} . Measurements of the precision (0.1–0.01 deg in magnetic pitch angle and 1–10 ms) necessary to address issues of AT control are difficult to do in this region ($\rho = 0.9$ –1.1). Using Zeeman polarization spectroscopy of the 2S-2P DIII-D lithium beam resonance line emission, measurements of the various field components may be made to the necessary precision in exactly the region of interest for these studies. Measurement time response may be improved by utilizing laser enhancement of the fluorescence signal with subsequent polarization analysis, or direct determination of the polarization state using a laser beam with time-varying polarization. Improvements to Ti:sapphire laser output power in the 670 nm region should permit pumping the Li 2P state to near saturation levels with a relatively simple system.

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- Prefer Oral Session
 Prefer Poster Session

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Special instructions: DIII-D Poster Session 2, immediately following L Zeng

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