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Edge Density Imaging Measurements of DIII-D Tokamak Plasmas using a Lithium Beam Probe and High Resolution Camera[1] M.F. MARTIN, Drexel University, H. STOSCHUS, ORISE, D.M. THOMAS, D.C. PACE, General Atomics — The Lithium Atomic Beam (LIBEAM) used on DIII-D has shown considerable potential to diagnose the density profile $n_e(r)$ with a radial resolution of $\Delta r = 0.5$ cm within the pedestal region. The LIBEAM parameters are $E < 30$ keV and $\sim$10 mA of equivalent neutral lithium current. Through the use of a filtered high resolution PCO Pixelfly CCD camera, the spectroscopic emission of the 670.8 nm Li[2p$-$2s] transition due to collisional excitation of the neutral lithium atoms is captured and analyzed. By appropriate image analysis, a high resolution profile of the beam intensity I_b can be discerned. Through the use of this beam intensity profile and collisional radiative models (CRM) the fine scale structure of the edge density profile $n_e(r)$ can be observed.

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