

## Status and characterization of the lithium beam diagnostic on DIII-D

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The 30 keV lithium beam diagnostic on DIII-D is suitable to measure both the radial electron density and poloidal magnetic field profiles in the pedestal. The refurbished system features a new setup to measure the Doppler shift allowing accurate alignment of the spectral filters. The injector has been optimized to generate a stable lithium neutral beam with a current of  $I = 15 - 20$  mA and a diameter of  $1.9 \pm 0.1$  cm measured by beam imaging. The typical temporal resolution is  $\Delta t = 1 - 10$  ms and the radial resolution of  $\Delta R = 5$  mm is given by the optical setup. A new analysis technique based on fast Fourier transform avoids systematic error contributions from the digital lock-in analysis and accounts intrinsically for background light correction. Latest upgrades and a detailed characterization of the system are presented. Proof-of-principle measurements of the poloidal magnetic field with a statistical error of typically 2% show a fair agreement with the predictions modeled in EFIT within 4%.

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