

Abstract Submitted
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Measurements of the Internal Magnetic Field and $n=3$ Level Populations of Injected Deuterium Using the B-Stark Motional Stark Effect Diagnostic on DIII-D¹ N.A. PABLANT, K.H. BURRELL, R.J. GROEBNER, D.H. KAPLAN, General Atomics, C.T. HOLCOMB, LLNL, B. DEN HARTOG, U. Wisconsin-Madison, H.P. SUMMERS, U. Strathclyde — We describe the latest results from the newly upgraded B-Stark diagnostic system installed on the DIII-D tokamak. This system is a version of a motional Stark effect (MSE) diagnostic based on the relative line intensities and spacing of the Stark-split D_α emission from injected neutral beams. We present a thorough study of the performance of the diagnostic in measuring the magnitude and direction of the internal magnetic field over a range of plasma conditions. Measurements were made with toroidal fields in the range 1.2 – 2.1 T and plasma currents in the range 0.5 – 2.0 MA. We also present results from a study of the level populations of the $n = 3$ state of the injected deuterium neutrals over a range of plasma densities, $1.7 - 9.0 \times 10^{13} \text{ m}^{-3}$, and neutral beam voltages, 50 – 81 keV. These results are compared against the calculations from an atomic physics code, part of the ADAS package.

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