

Abstract Submitted  
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**Measurements of the Internal Magnetic Field on DIII-D Using Intensity and Spacing of the Motional Stark Multiplet<sup>1</sup>** N.A. PABLANT, University of California-San Diego, K.H. BURRELL, General Atomics, M.F. GU, C.T. HOLCOMB, Lawrence Livermore National Laboratory — We describe a version of a motional Stark effect diagnostic based on the relative line intensities and spacing of Stark split  $D_\alpha$  emission from the neutral beams. Using this technique both the magnitude and direction of the internal magnetic field can be measured, in contrast to motional Stark effect (MSE) polarimetry, which can only measure the direction. This system, named B-Stark, has been recently installed on the DIII-D tokamak. To find the magnetic pitch angle, we use the ratio of the intensities of the  $\pi_3$  and  $\sigma_1$  lines. These lines originate from the same upper level, and so are not dependent on the population levels. The magnitude of the internal B-field is determined from the wavelength separation of the various Stark components. We fit the spectra using a simple Stark model in which the upper level populations of the  $D_\alpha$  transition are treated as free variables. The magnitude and direction of the magnetic field obtained using this diagnostic technique compare well with measurements from MSE polarimetry and EFIT.

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