

Abstract Submitted  
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**Midplane Neutral Density Profiles in NSTX**<sup>1</sup> D.P. STOTLER, F. SCOTTI, R.E. BELL, B.P. LEBLANC, PPPL, R. RAMAN, U.Wash. — The experimental determination of neutral densities in tokamak plasmas from line radiation is only accurate in the narrow region in which both the excitation rate and neutral density are significant; elsewhere the result is dominated by noise. We propose an alternative, simulation based inversion procedure utilizing tools developed in the validation of the DEGAS 2 Monte Carlo neutral transport code against Gas Puff Imaging camera data.<sup>2</sup> Here, the Balmer- $\beta$  emission rate recorded by an absolutely calibrated tangentially viewing camera is used to quantify a simulated, ad hoc neutral gas source at the vacuum vessel wall. This procedure yields absolute radial profiles of deuterium atoms and molecules at midplane. The validity of this characterization of the gas source is confirmed by the similarity of the shapes of the simulated and observed light emission profiles. We also compare the resulting neutral pressures at the vessel walls with data from midplane micro-ion gauges.

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<sup>2</sup>B. Cao, et al., Fusion Sci. Tech. **64**, 29 (2013).

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