Abstract Submitted for the DPP07 Meeting of The American Physical Society

Development of a Fast-Ion D-Alpha diagnostic for NSTX¹ MARIO PODESTA', W.W. HEIDBRINK, UC Irvine, CA 92697, R.E. BELL, W. SOLOMON, PPPL, Princeton, NJ 08543, V. SOUKHANOVSKII, LLNL, Livermore, CA 94550 — A Fast-Ion D-Alpha diagnostic based on active charge exchange recombination spectroscopy is being developed for NSTX. The first results from the 2007 run, obtained with a prototype setup, indicate that fast ion signals have been successfully detected. The signals show a clear time correlation with the neutron emission from beam-plasma reactions. During modulation of the injected neutral beam power, variations on the fast ion slowing down time-scale are observed. The signal amplitude from different spectral regions scales accordingly with the fast ion D_{α} spectrum. For the 2008 run, sixteen channels will cover the outboard poloidal cross-section with a resolution in space, time and energy of 5cm, 10ms and 10keV. In addition, three dedicated channels will monitor the signal from suprathermal ions on time-scales ~ 10 us at different radii. Each channel includes two views inside the plasma, intercepting/missing the neutral beam for a direct subtraction of the background signal not associated with fast ions.

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