Abstract Submitted for the DPP05 Meeting of The American Physical Society

Experimental studies of C-Mod ICRF minority tails via a multichannel compact neutral particle analyzer¹ V. TANG, R. PARKER, P. BONOLI, C. FIORE, R. GRANETZ, A. HUBBARD, J. IRBY, Y. LIN, J. LIPTAC, E. MARMAR, S. WUKITCH, K. ZHUROVICH, MIT PSFC, R. HARVEY, CompX, R. ANDRE, PPPL — Recent experimental results from the upgraded multi-channel Compact Neutral Particle Analyzer (CNPA) system are presented and compared with numerical simulations. The CNPA system consists of Si diode detectors and measures charge exchange (CX) induced energetic (>40 keV) neutral particles for ICRF hydrogen minority tail temperature diagnosis. A new long-pulse diagnostic neutral beam (DNB) provides the neutrals for active CX. The discussed data involve measurements of the Hydrogen-minority energy spectrum during low to moderate $(n_e \sim 2x10^{20}/m^2)$ density ICRF plasmas with up to ~3 MW of ICRF power and B_T from 4.4 to 6.2T. During these discharges, evidence of fast ion resonance localization and tail temperatures greater than 100keV is observed. The energy distributions are compared with a synthetic diagnostic based on CQL3D Fokker-Planck simulations. ICRF power deposition densities and efficiencies are also inferred.

¹Work supported by DoE

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Date submitted: 25 Aug 2005

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