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Measurements of RF-driven Energetic Ion Tails in TFTR D-T Plasmas Using the Pellet Charge eXchange (PCX) Diagnostic[1] H.H. DUONG, General Atomics ORAU Fellow At PPPL, R.K. FISHER, J.M. MCCHESNEY, P.B. PARKS, General Atomics, D.K. MANSFIELD, S.S. MEDLEY, A.L. ROQUEMORE, Princeton Plasma Physics Laboratory, M.P. PETROV, Ioffe Institute — The PCX diagnostic utilizes charge exchange interactions of ions with the ablation cloud surrounding an injected low-Z impurity pellet to measure the energy spectrum and radial profile of energetic confined particles in a fusion plasma. On TFTR, we employ this technique to detect energetic alphas from D-T reactions, tritons from D-D reactions, and ICRF-driven minority tail ions (e.g., H, ^{3}He, T). This presentation focuses on results from recent RF experiments investigating the heating of deuterium-tritium plasmas in the second harmonic tritium cyclotron frequency regime. Preliminary analyses show formation of a high energy ion tail with most of the tail formation occurring within 0.2 m of the resonance surface with $T_{eff} \leq 355$ keV. The PCX tritium ion tail data, in combination with the diamagnetic data showing an increase in the thermal stored energy, support the idea of using $2\Omega_T$ ICRF heating as a viable technique for heating low density ITER startup plasmas.

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