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Measurements of the Confinement and Transport of Alpha Particles in TFTR Using the Pellet Charge Exchange Diagnostic[1] R.K. FISHER, P.B. PARKS, J.M. MCCHESNEY, *General Atomics*, H.H. DUONG, *General Atomics ORAU Fellow at PPPL*, S.S. MEDLEY, D.K. MANSFIELD, A.L. ROQUEMORE, *Princeton Plasma Physics Laboratory*, M.P. PETROV, *Ioffe Physical-Technical Institute, St. Petersburg, Russia*, N.N. GORELENKOV, *TRINITI, Troisk, Russia*
— The energy spectra and radial density profiles of energetic confined alpha particles are measured in TFTR using the Pellet Charge Exchange (PCX) diagnostic. The shape of the alpha energy spectra can be used to determine the ratio of the alpha confinement time $\tau_{\rm conf}$ to the alpha slowing-down time $\tau_{\rm sd}$, with the best fit to the measured energy spectra in the plasma core showing $\tau_{\rm conf} \gg \tau_{\rm sd}$ and a lower limit of $\tau_{\rm conf}/\tau_{\rm sd} \geq 3$. Similarly, the measured radial profiles of the alpha particle density can be used to determine an upper limit on the radial diffusion coefficient for the energetic alphas of $D_\alpha \leq 0.03$ m^2/s. Stochastic diffusion due to toroidal field ripple affects the radial profile outside the plasma core. The alpha distributions are modeled using TRANSP and the Fokker-Planck Post-TRANSP (FPPT) code. The uncertainties in the alpha measurements and modeling will be discussed.

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