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Time Evolution of Density Profiles in ET[1] R.J. TAYLOR, J.-L. GAUVREAU, P.-A. GOURDAIN, D.J. LAFONTEESE, L.W. SCHMITZ, Physics and Astronomy Department, UCLA — We observe a persistent particle pinch in ET (R = 5 m, B = 0.25 T, A = 5, a = 1 m, I_p = 60 kA), in which the ion dynamics is classical and the electron dynamics is subdominant. The ion banana dynamics drives a poloidal rotation which sets up a radial potential, trapping the bulk ions in an electrostatic well. The trapping rate agrees with the neoclassical ion mobility. The density peaking results in an MHD unstable configuration, which empties the trap rapidly with no significant current channel disruption. This process repeats on a 1 second time scale with large beta swings. Analysis shows that the radial pinch can dominate the radial particle diffusion in quiescent plasma. This is attributed to the large size of ET and contributes to an enhanced neo-Alcator confinement even though the toroidal magnetic field is very low (0.2 Tesla). This behavior has been modeled using neo-Alcator electrons and neo-classical ions. Time evolution density profile predictions for ITER, assuming no MHD instabilities, will be given.

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