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Density Profile Consistency and Particle Pinch Velocities in DIII-D¹ D.R. BAKER, General Atomics — It has been recently proposed that, for L-mode discharges, there exists a consistent density profile for the trapped electrons in a high aspect ratio circular cross-section tokamak which goes as $1/q$, where q is the usual safety factor.² It is shown here that this result can be extended to non circular cross sections and moderate aspect ratio tokamaks by the expression $n_e \propto 1/qH$, where H is the derivative of the plasma volume with respect to the toroidal flux. This expression is compared to the time evolution of the measured electron density profile for DIII-D L-mode shots where the q profile is changed in time during the discharge. It is also found that this relation is maintained reasonably well in recent high performance DIII-D shots with “weak central shear” and an L-mode type edge. Once an expression for the consistent density profile is known, it is trivial to obtain an expression for V_p/D , where V_p is the particle pinch velocity and D is the particle diffusion coefficient.³ This expression is compared with the value of V_p/D which is obtained from an ONETWO analysis of certain ELM-free H-mode DIII-D discharges.

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²M.B. Isichenko, *et al.*, Phys. Rev. Lett. **74**, 4436 (1995).

³V.V. Yankov, JETP Lett. **60**, 171 (1994).

Prefer Oral Session
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