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**PTRANSP**
**Simulations of Toroidal Momentum Transport in Neutral Beam Heated Tokamak Plasmas** F.D. HALPERN, G. BATEMAN, A.H. KRITZ, A.Y. PANKIN, Lehigh U., R.V. BUDNY, D.C. MCCUNE, PPPL — The PTRANSP code is used to predict self-consistently the toroidal rotational frequency, electron temperature, ion temperature, and $\mathbf{E} \times \mathbf{B}$ flow shear rate. Turbulence-driven thermal transport and toroidal momentum transport are computed using several transport models. A neoclassical contribution is added to the turbulence-driven toroidal momentum transport and thermal transport. It is found that inward fluxes of momentum can be generated by the Reynolds stress in the Weiland transport model. The neutral beam injection torque input, computed using the NUBEAM code, drives rotation in the plasma core, while charge exchange can drive rotation near the plasma edge. The poloidal velocity is computed using neoclassical theory. In H-mode discharges, it is found that the largest contribution to the $\mathbf{E} \times \mathbf{B}$ flow shear is usually a consequence of toroidal rotation. The rotation frequency is investigated as a function of plasma parameters including the torque per particle. The simulated radial profiles of the toroidal rotational frequency, ion temperature, and electron temperature are compared with experimental data.

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