Abstract Submitted
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**Methods for Modeling Burning Plasmas and Validation using TFTR and JET DT Plasmas**[1] R.V. BUDNY, C. KESSEL, K. INDIRESHKUMAR, D. MCCUNE, PPPL, J. CANDY, R.E. WALTZ, General Atomics, TFTR TEAM, JET-EFDA TEAM — Time-dependent integrated modeling is needed to increase our confidence in predictions for Tokamak burning plasmas. The PTRANSP project is modifying the TRANSP plasma analysis code to strengthen its predictive capabilities, including the GLF23 predictive model which has been benchmarked using gyrokinetic codes such as GYRO that simulate the turbulence induced transport of energy, angular momentum, and species.We use a prototype of PTRANSP to generate time-dependent models of ITER plasmas in several regimes such as the ELMy H and Hybrid modes.We performed checks to verify and validate the procedure. The PTRANSP plasma profiles are used as inputs in the GYRO code for simulating the nonlinearly-saturated ITG/TEM turbulence and transport. The turbulence depends sensitively on drive terms such as $\nabla(T_i)$ and suppression terms such as the external $E \times B$ flow shear which scales as $\nabla(E_r)$. We derive the $E_r$ profiles from predictions of the NNBI-induced toroidal velocity and the neoclassical poloidal velocity. Slight ($\simeq$ 15 %) variations of $\nabla(T_i)$ and $\nabla(E_r)$ give transport consistent with the PTRANSP results. We compare these procedures with experimental results from DT plasmas produced in TFTR and JET.

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