Initial Tests of TGLF Transport Model With Experimental H-Mode Pedestal Data in DIII-D*

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Obtaining a predictive capability for the H-mode pedestal structure requires the development of theory-based transport models, which are applicable to the H-mode edge. The TGLF (trapped-gyro-Landau-fluid) transport model has been developed to include this capability [1]. This model provides a fast and accurate approximation to the linear eigenmodes for gyrokinetic drift-wave instabilities. Moreover, the range of validity of this model is extended to encompass the conditions of the H-mode-pedestal (trapping, general toroidal geometry, fully electromagnetic, electron-ion collisions, impurity ions). Initial testing of this model is being performed against experimental H-mode pedestal data and will be presented. Experimental MHD equilibria, ion and electron temperature profiles and ion and electron density profiles are used as inputs to the model to compute the linear growth rates, as a function of wavenumber, for the gyrokinetic drift-wave instabilities. Experimental data are used to compute the ExB shearing rate. The linear growth rate of the most unstable mode will be compared against the ExB shearing rate to determine if the latter is large enough to stabilize the linear modes.

[1] G.M. Staebler, J.E. Kinsey, R.E. Waltz, Phys. Plasmas **12** (2005) 102508.

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