

Confinement Improvement with Higher Beta in Low NBI Torque QH-mode Discharges*

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Experiments in quiescent H-mode discharges on DIII-D have shown access to operation at high beta and low rotation (with low or zero NBI torque), by using the counter- I_p torque from static nonaxisymmetric magnetic fields. In this new regime, a 20% improvement in the energy confinement time is observed when the plasma pressure is increased by $\lesssim 20\%$. The reduction in energy transport is correlated with a reduction in low and intermediate wavenumber density fluctuations measured by BES and DBS diagnostics. Predictions of linear turbulence growth rates from TGLF are remarkably consistent with the measurements. The TGLF calculations confirm that ExB shear effects are not playing a role in the observed confinement improvement. The effects of changes in Shafranov shift, temperature, and density profiles are being investigated. Results will be discussed.

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