

# Burning Plasma Confinement Projections and Renormalization of the GLF23 Drift-Wave Transport Model

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## Abstract

Fusion power predictions are presented using the GLF23 drift wave transport model for several next-step tokamak designs including ITER, FIRE, and IGNITOR. The GLF23 model has been renormalized using recent gyrokinetic simulations and a database of nearly fifty H-mode discharges from three different tokamaks. The renormalization reduces the ITG/TEM driven transport by a factor of 3.7 while ETG mode transport is increased by a factor of 4.8 with respect to the original model. Using the renormed model, the fusion power performance is uniformly assessed and the pedestal requirements are summarized for each device. The renormed model is still quite stiff and yields somewhat more optimistic predictions for next-step burning plasma experiments. The consequences of stiff transport in the plasma core are discussed. A fusion fit formula is derived whereby the GLF23 results follow a universal stiff model curve for the normalized fusion power versus pedestal temperature.

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