Transport Model Based on Turbulence Simulations Follows Many Experimental Trends

RMS err = 26.4%

DIII-D, JET, TFTR
L&H-modes

Kinsey, General Atomics
ITER profile database+DIII-D

X-axis: Experimental W_{th} (MJ)
Y-axis: GLF Predicted W_{th} (MJ)
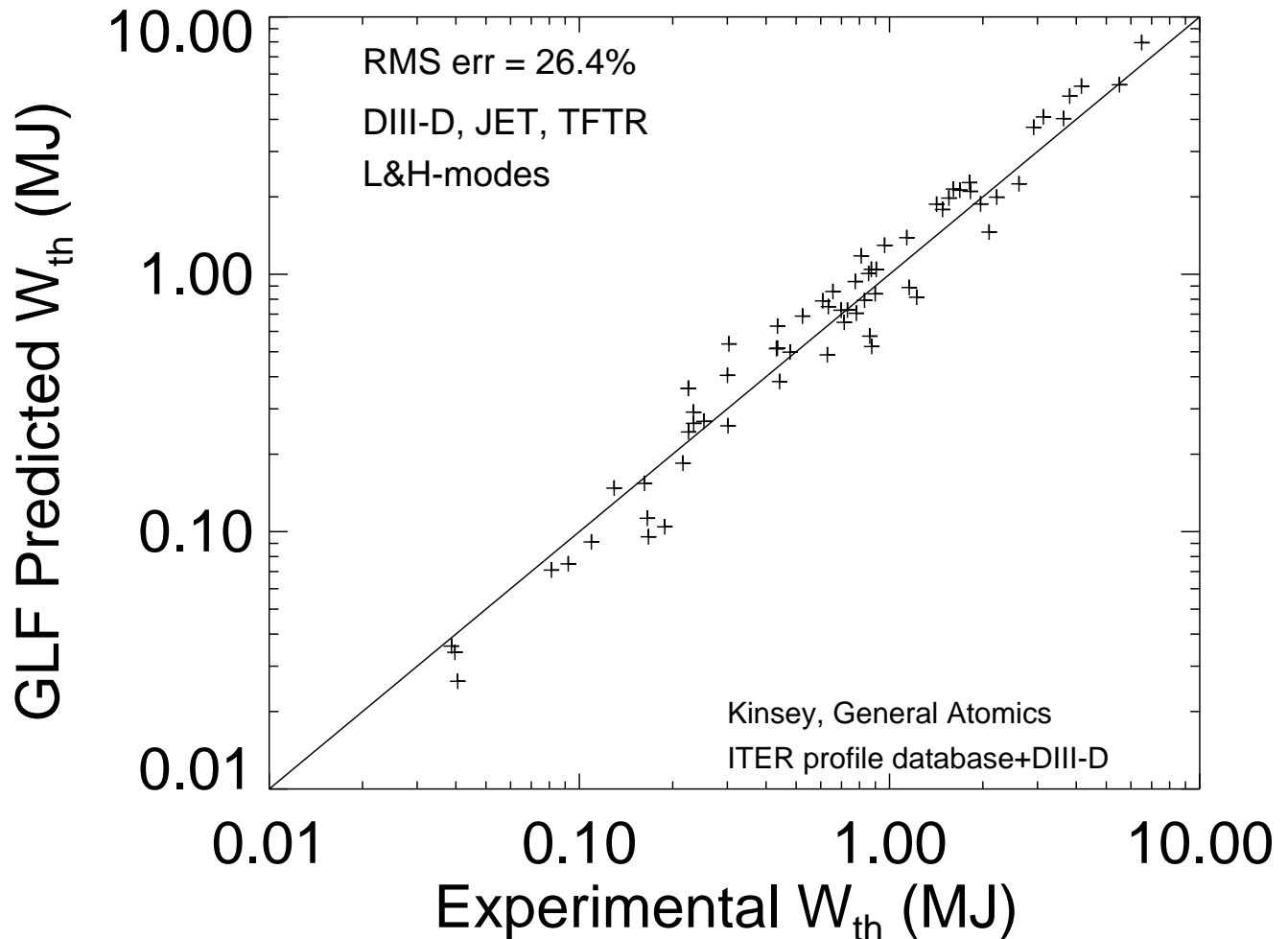
- GLF23 transport model by Waltz et.al fitted to Beer et.al. nonlinear 3-D gyrofluid simulations of ITG/trapped-electron turbulence.

- Encouraging results so far, but many caveats: uses measured density and rotation profiles, uses measured temperatures at $r/a = 0.9$, electrostatic turbulence simulations need extension to magnetic fluctuations ($\sim 10 \times$ CPU time), gyrofluid/gyrokinetic discrepancy, etc... Much future work needed to be more accurate over a wider range of plasma parameters.