ADVANCES IN PREDICTION OF TOKAMAK EXPERIMENTS WITH THEORY-BASED MODELS

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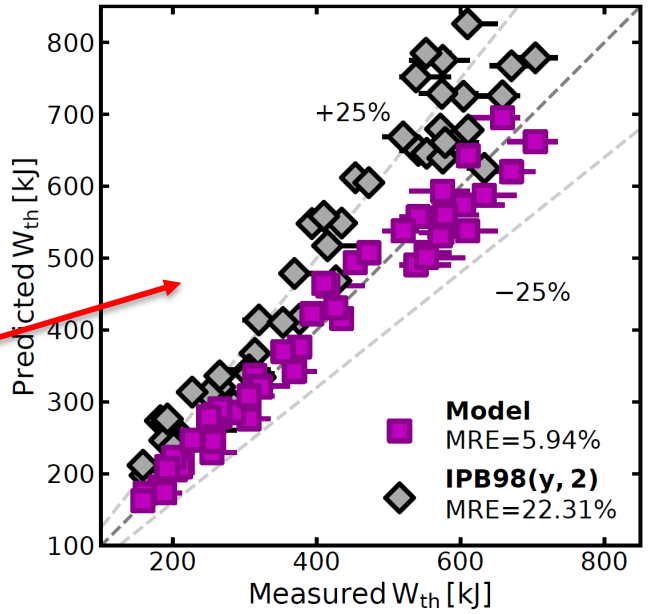
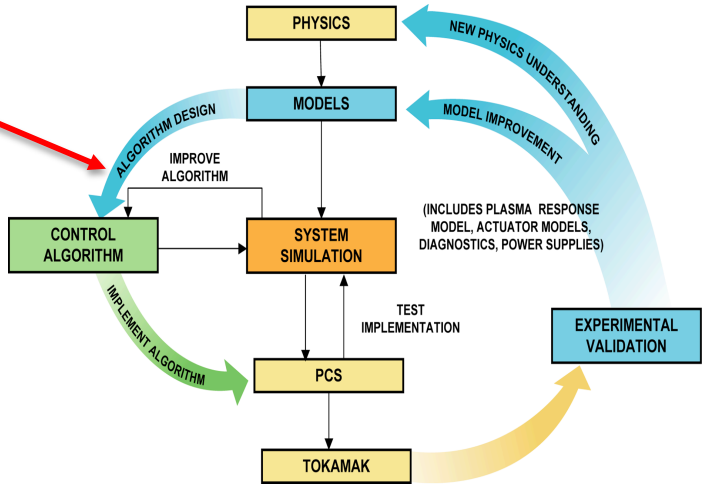
- Theory-based models of core transport and pedestal structure have achieved a validated prediction accuracy of 20%
- Integrated modeling workflows have been developed that can predict tokamak stored energy better than empirical scaling
- A pulse design simulator (PDS) that couples integrated modeling workflows with plasma control simulation is technically feasible





A "predict-first" initiative is needed now: routinely using a PDS in experimental planning and collecting a use database to quantify the uncertainty in the predictions