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Theory Experiment

Modeling ITER and DIII-D Current Ramps for Startup Similarity Experiments,* T.A. Casper, W.H. Meyer, L.D. Pearlstein, *LLNL*; G.L. Jackson, J.R. Ferron, A.W. Hyatt, T.C. Luce, T.W. Petrie, W.P. West, *GA*; M. Murakami, *ORNL*; R.A. Moyer, D.L. Rudakov, *UCLA* – We have begun similarity experiments on DIII-D to validate ITER startup scenarios and to explore possible alternatives. The reference startup scenario for ITER specifies breakdown near the outer limiter with shape variations correlated with the current ramp to give constant q until X-point formation. This evolution differs from startup prescriptions for existing tokamaks. Corsica simulations of the ITER current ramp indicate that the prescribed I_p may be difficult to achieve. Corsica is used to simulate ITER similarity experiments on DIII-D to validate startup design models. Possible alternatives that maintain vertical stability and the possibility for higher safety factor, $q_{\min} > 1$, more conducive to advanced tokamak and hybrid modes will be explored. The simulations use free-boundary evolution coupled with radial transport to assess the shape evolution and vertical stability.

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