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Toward High I_N Operation in the Pegasus Toroidal Experiment[1] E.A. UNTERBERG, University of Wisconsin-Madison, PEGASUS TEAM — The present experimental goal of the Pegasus experiment is to delineate the external kink boundary, which determines the low-q, high-I_N operational space for an ultra-low-A ST. Equilibrium and stability modeling projects stable equilibria approaching $I_p/I_{TF} \sim 3$ ($I_N \sim 20$). Upgrades to the facility added improved position and shape control, increased and time-variable toroidal field, and programmable loop voltage. These upgrades allow for greater flexibility in q(r,t) tailoring and should provide access to $I_p/I_{TF} > 1$ and the external kink boundary. The Phase I operating space has been recovered, with discharges characterized by $I_{p,max} \sim 150$ kA, $<n_e> \leq 0.6$ n_{GW}, and large 2/1 tearing modes. Experiments to date have focused on resistive MHD mode suppression by using the expanded capabilities to tailor plasma startup. Tearing mode mitigation has been demonstrated with plasma-current ramp-rate control (from 5-30 MA/s) and improved gas handling with $<n_e> \geq 0.6$ n_{GW}. Electrostatic plasma guns have been installed to increase the effective V-s and to provide plasma startup without a central solenoid.

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