Abstract Submitted
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Using Quiescent H-mode to Access an Improved High Pressure Plasma Edge[1] W.M. SOLOMON, B.A. GRIERSON, R. NAZIKIAN, PPPL, K.H. BURRELL, A.M. GAROFALO, T.H. OSBORNE, P.B. SNYDER, General Atomics, A. LOARTE, ITER, G.R. MCKEE, U. Wisc.-Madison, M.E. FENSTERMACHER, LLNL — Experiments on DIII-D have extended Quiescent H-mode (QH-mode) to high density through the use of strong shaping, overcoming a long-standing limitation in QH-mode operation, a high confinement state of the plasma that does not exhibit edge localized modes. These experiments have navigated a valley of improved edge peeling-ballooning stability dubbed "Super H-mode," which opens up at high density with strong plasma shaping. The thermal energy confinement time increases due to improvements in both the pedestal height and the core transport. Theoretical calculations of the pedestal height and width as a function of density using the EPED model are in quantitative agreement with the measurements. Together with the achievement of high beta, high confinement and low q_{95} for many energy confinement times, these results extend QH-mode as a potentially attractive operating scenario for ITER and point to a path for a new high performance regime that could improve the attractiveness of a fusion reactor.

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Wayne Solomon
Princeton Plasma Physics Laboratory

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