

Compatibility of Detached Divertor Operation with Robust Edge Pedestal Performance

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Abstract

The compatibility of detached radiative divertor operation with a robust H-mode pedestal is examined in DIII-D. A density scan produced low temperature plasmas at the divertor target, $T_e \leq 2$ eV, with high radiation leading to a factor of ≥ 4 drop in peak divertor heat flux. The cold radiative plasma was confined to the divertor and did not extend across the separatrix in X-point region. A robust H-mode pedestal was maintained with a small degradation in pedestal pressure at the highest densities. The response of the pedestal pressure to increasing density is reproduced by the EPED pedestal model. However, agreement of the EPED model with experiment at high density requires an assumption of reduced diamagnetic stabilization of edge Peeling-Ballooning modes.