Abstract Submitted
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Compatibility of Detached Divertor Operation with Robust Edge Pedestal Performance[1] A.W. LEONARD, T.H. OSBORNE, P.B. SNYDER, General Atomics, M.A. MAKOWSKI, A.G. MCLEAN, Lawrence Livermore National Laboratory — The compatibility of radiative detached divertor operation with the maintenance of a robust H-mode pedestal is examined in DIII-D. A density scan with deuterium injection into H-mode spanned a range of divertor conditions from fully attached, ∼30 eV at the target, with little divertor radiation to a fully detached with $T_e < 5$ eV throughout the divertor up to the X-point. Over this scan of pedestal density from n/n_{GW} =30% to 60% the pedestal T_e was reduced from 800 eV to 350 eV, representing a ∼20% reduction in pedestal pressure with a similar reduction in normalized energy confinement. The reduction in pedestal pressure at high density was found to be consistent with a reduced pedestal ELM MHD stability limit at high collisionality. The scaling of the pedestal top pressure with density was also consistent with the EPED model, which assumes an additional constraint on the local pressure gradient. The MHD stability limit at the highest collisionality depends on details of the ELM instability growth rate normalization. This result is encouraging for future burning plasmas where a low collisionality pedestal is expected to be maintained even for high density detached divertor operation.

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