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The Effect of the Grad-B Drift Direction on the Elming H-Mode Density Limit in DIII-D¹ T.W. PETRIE, R.J. GROEBNER, A.W. LEONARD, M.A. MAHDAVI, D.M. THOMAS, W.P. WEST, General Atomics, S.L. ALLEN, M.E. FENSTERMA-CHER, C.J. LASNIER, Lawrence Livermore National Laboratory, R. MAINGI, Oak Ridge National Laboratory, J.G. WATKINS, Sandia National Laboratories — We investigate the H-L density limit in single-null divertors operating under ELMing H-mode conditions. The parameter range covers: $I_p = 0.6\text{--}2.0$ MA, $B_t = 1.0\text{--}2.1$ T, and $P_{in} = 3\text{--}12$ MW. We find that the grad-B drift direction is important in determining divertor and edge plasma behavior at high density. When the grad-B drift direction is toward the X-point, the density limit in SN divertors scales as $\bar{n}_{e,HL} \sim P_{in}^\alpha/B_t^\gamma$, $\alpha \sim 0.1$, $\gamma \sim 0.5\text{--}0.7$, for $q_{95} > 4$ and has a stronger than linear dependence on plasma current. If the grad-B drift is away from the X-point, this power dependence appears to be slightly higher (i.e., $\alpha \sim 0.2$), and the H-L density limit is 15%–30% lower. Details of how the grad-B drift direction affects the divertor and edge plasmas are presented.

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- Prefer Oral Session
 Prefer Poster Session

T.W. Petrie
petrie@gav.gat.com
General Atomics

Special instructions: DIII-D Poster Session I (transport, turbulence, & stability), immediately following Carlstrom

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