

Abstract Submitted  
for the DPP16 Meeting of  
The American Physical Society

**Detachment of helium plasmas in DIII-D**<sup>1</sup> A.R. BRIESEMEISTER, J.M. CANIK, R.C. ISLER, D.L. HILLIS, M.W. SHAFER, ORNL, A.G. MCLEAN, M.A. MAKOWSKI, M.E. FENSTERMACHER, W.H. MEYER, LLNL, A.L. MOSER, H. WANG, GA, J.G. WATKINS, SNL — In low power, Ohmic plasmas, the high recycling regime typically seen as core density is increased in deuterium plasmas, was not observed in helium plasmas. When neutral helium beam heating was added, the high recycling regime returned as predicted using the SOLPS code. Modeling shows that increasing input power reduces neutral penetration across the separatrix, reducing radiation from the confined plasma and allowing a larger fraction of the input power to be carried into the scrape off layer. Detailed measurements including divertor ion and electron temperatures and densities and radiation emission patterns are presented at a variety of heating levels including both H and L-mode plasmas. An understanding of the differences between detachment in the helium and deuterium plasmas will be important for understanding how divertor conditions in the helium startup phase of ITER will differ from those in deuterium operation.

<sup>1</sup>Work supported by the US DOE under DE-AC05-00OR22725, DE-AC52-07NA27344, DE-FC02-04ER54698, DE-AC04-94AL85000.

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Date submitted: 14 Jul 2016

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