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Effect of Pellet Injection on the Edge Radial Electric Field and the H-mode Power Threshold¹ P. GOHIL, K.H. BURRELL, General Atomics, L.R. BAYLOR, T.C. JERNIGAN, Oak Ridge National Laboratory — The working model of plasma turbulence suppression by sheared $E \times B$ plasma flow has led to a good understanding of the transition from L-mode to H-mode plasmas. An important issue in this work is the ability to change and control the edge radial electric field, E_r , on demand in order to produce the H-mode. At DIII-D, shallow penetration of deuterium pellets is being investigated as a means to changing the edge electron density and gradients in order to produce changes in the radial electric field. The present study is motivated by the use of pellet injection to produce H-mode plasmas in TUMAN-3 and T-10. Also, significant perturbations to the edge plasma conditions in this manner can be used to reveal the important parameters in the formation of the edge transport barrier. Results will be presented on the edge plasma conditions and the experimental methods used. An important part of this work is to effectively lower the threshold power required to obtain H-mode plasmas. Experiments will be performed with pellet injection into L-mode plasmas at input powers significantly below the H-mode threshold power.

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