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L-H Power Threshold and Transition Studies in DIII-D¹ T.N. CARLSTROM, R.J. GROEBNER, D.M. THOMAS, K.H. BURRELL, General Atomics, L.W. OWEN, B.A. CARRERAS, Oak Ridge National Laboratory — Neutrals have been suspected of playing a role in the L-H transition and may be a hidden variable in the determination of the power threshold scaling. Generally, there is a strong correlation between electron density and neutral pressure which makes it difficult to separate the role of neutrals from that of the density in the L-H transition. We have performed density ramping experiments using gas puffing and cryopumping to break this correlation in order to study the effects of neutrals on the L-H transition and the power threshold. Preliminary analysis indicates that for a factor of two increase in the neutral pressure, the power threshold increases by 50 percent. Further analysis of the edge conditions, including neutral particle modeling, will be presented and compared with theoretical models of E_r formation and poloidal rotation. The power hysteresis of the H-mode and the conditions leading to a back transition have also been investigated. The H-L transition occurs on about a 100 μ s time scale and a 30%–60% power hysteresis is observed.

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☒ Prefer Oral Session
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