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Neutrals Studies in the Modified Upper Divertor of DIII-D¹ R.J. COLCHIN, R. MAINGI, D.L. HILLIS, C.C. KLEPPER, L.W. OWEN, M.R. WADE, Oak Ridge National Laboratory, S.L. ALLEN, Lawrence Livermore National Laboratory, C.M. GREENFIELD, D.M. THOMAS, General Atomics, G.R. MCKEE, U. of Wisconsin — Neutrals play an important role in plasma fueling and in divertor and edge physics through the damping of momentum, particle, and energy flows. New neutrals-related diagnostics installed on DIII-D include 16 midplane and 15 divertor monitors of neutral deuterium, and fast neutral pressure gauges which are located in the upper divertor plenum and on the DIII-D midplane. During a seven-day campaign to determine upper divertor and core performance, the neutral particle balance was determined with the upper cryopump operating. These studies showed that the walls were initially outgassing, but that subsequent high power beam conditioning established wall pumping, leading to density control in H-mode upper-single-null divertor plasmas. The b2.5 plasma edge and DEGAS Monte Carlo codes are being used to study pumping aspects of these discharges, as well as observed changes in divertor $D\alpha$ and midplane neutral pressure.

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