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Neutral Fueling From Recycling and Contributions to Pedestal Density Profiles in DIII-D[1] A.W. LEONARD, R.J. GROEBNER, General Atomics, G.D. PORTER, Lawrence Livermore National Laboratory — Pedestal density widths in DIII-D are compared with the ionization profiles due to recycled neutrals. The neutral ionization profile is determined by neutral Monte-Carlo calculations based on ion flux measurements to the divertor and a plasma background reconstruction constrained by measurements. Previous studies have indicated that pedestal ionization is dominated by the inboard divertor neutral sources with smaller contributions from the main chamber in DIII-D. A density scan in H-mode is examined where the pedestal density width remains constant. The pedestal ionization rate increases at high density and inboard divertor detachment due to a longer mean free path for neutrals and an increased recombination source for neutrals. The possibility of an inward plasma pinch is explored as a possible explanation for the nearly constant pedestal density width under changing conditions of neutral sources and divertor plasma parameters.

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