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Coupled 1-D Plasma-Neutral Transport Simulations of Pedestal Behavior in DIII-D H-Mode Plasmas,* L.W. Owen, *ORNL*, and R.J. Groebner, *GA*, – The relative roles of plasma and neutral transport in the structure of the H-mode density pedestal are investigated. 1-D (radial) equations for the plasma density and temperatures are solved iteratively with Monte Carlo calculations of the particle and energy source terms. With the pedestal height prescribed as a boundary condition, various forms are assumed for the particle diffusivity D in H-mode, including finite width barriers and functions with a single finite scale length step-up inside the separatrix. A general trend in DIII-D experiments is for the density pedestal width to vary inversely with the height, but this is not always true. As the density pedestal rises after the L-H transition the width often increases. It is shown that the observed temperature increase cannot explain the magnitude of the width increase. The simulations suggest that the transport coefficients change as the plasma evolves toward the first ELM. If simultaneously D decreases and the scale length of the step-up increases in the rise phase, the pedestal width increases with height.

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