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SOLPS modeling of neutral effects on pedestal structure during pellet fueling[1] AARON SONTAG, M.W. SHAFER, D. SHIRAKI, Oak Ridge National Laboratory, F. LAGGNER, A.O. NELSON, Princeton University / Princeton Plasma Physics Laboratory — SOLPS-ITER has been used to model a set of discharges with the neutral particle source location varied from being dominantly external with an external gas puff for fueling and ECH for particle-free core heating, to being dominantly internally sourced with pellet fueling and NBI heating. Pellet fueling is modeled as a constant neutral source in the pedestal region where pellet ablation is observed. The discharges with core pellet and NBI fueling show increased pedestal density and an increase of over 30% in the ratio of the pedestal to separatrix density. Modeling shows that all cases have similar particle confinement in the steep-gradient region of the pedestal, but moderate pellet fueling increases particle diffusion from the no-fueling case and decreases electron thermal transport inside ψ_N of 0.9. Higher fueling leads to increased electron thermal transport in the steep gradient region for all cases due to increased convective flow. Ion charge exchange momentum loss is increased by a factor of 4 across the entire pedestal with external fueling as compared to core fueling. The inclusion of ∇B drift effects results in an inward flux of particles for all cases, significantly altering the neutral deposition profile.

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