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Simulations of Neon Pellets for Plasma Disruption Mitigation in Tokamaks NICOLAS BOSVIEL, ROMAN SAMULYAK, Stony Brook University, PAUL PARKS, General Atomics — Numerical studies of the ablation of neon pellets in tokamaks in the plasma disruption mitigation parameter space have been performed using a time-dependent pellet ablation model based on the front tracking code FronTier-MHD. The main features of the model include the explicit tracking of the solid pellet/ablated gas interface, a self-consistent evolving potential distribution in the ablation cloud, JxB forces, atomic processes, and an improved electrical conductivity model. The equation of state model accounts for atomic processes in the ablation cloud as well as deviations from the ideal gas law in the dense, cold layers of neon gas near the pellet surface. Simulations predict processes in the ablation cloud and pellet ablation rates and address the sensitivity of pellet ablation processes to details of physics models, in particular the equation of state.

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