

Abstract Submitted
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ELM simulations with M3D¹ H.R. STRAUSS, G.Y. PARK, C.S. CHANG, S. KU, NYU, L. SUGIYAMA, MIT, J. BRESLAU, G.Y. FU, W. PARK, PPPL — Large scale ELM simulations using the M3D extended MHD code with up to 40 toroidal modes were carried out as part of a DOE milestone. Simulations were done starting from DIII-D EFIT equilibria. Nonlinear computations were performed both with and without gyroviscous stabilization. Gyroviscosity with a relevant Hall parameter had little effect on the nonlinear ELM behavior, which is dominated by moderate toroidal modes. Nonlinear ELM simulations have also been carried out in ITER geometry. In the ITER simulations, substantial outflow of density to the divertor was observed. Upwinded numerical methods were introduced in M3D to deal with nonlinear advection of the pedestal density. Mesh generation was improved to deal with a realistic boundary shape. Simulations have also been done in which the bootstrap current, pressure pedestal, and density pedestal were calculated with the XGC kinetic neoclassical edge code. The effects on ELMs of varying the bootstrap current and pressure profiles will be considered.

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H.R. Strauss
NYU

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