Abstract Submitted
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Particle simulation of runaway electrons in rippled tokamaks with pellet suppression effects[1] D. A. SPONG, L. CARBAJAL GOMEZ, D. DEL-CASTILLO-NEGRETE, L. BAYLOR, S. SEAL, Oak Ridge National Laboratory — Runaway electrons are of significant concern for large tokamak devices both due to gradual acceleration by the Ohmic heating field and the more rapid acceleration and avalanche production that can occur during major disruptions. We have developed a simulation model (KORCGC) that follows large number of runaway guiding center (GC) orbits, taking into account Coulomb collisions, impurities, synchrotron radiation, rippled (3D) fields, and electric field acceleration, including inductive effects. Applications to pellet suppression experiments have been made and show similar effects (current/energy decay rates) as the observations. The model uses a hybrid (MPI/OpenMP) design and shows excellent parallel scaling. The energy parameters of runaway pellet suppression and formation fit within the limits of the GC approximation and the longer timesteps allowed by GC facilitate modeling over relevant timescales. Simulations of impurity injection dissipation experiments on DIIID and ITER will be discussed.

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