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Calculation of Runaway Electron Formation in Tokamak Thermal Quench Including Electron-Electron Collisions DAVID ABRAMOVITCH, University of California, Berkeley, CHANG LIU, Princeton Plasma Physics Lab, DYLAN BRENNAN, Princeton University — Runaway Electrons (REs) are a great concern in tokamak plasmas, particularly in ITER due to the potential for highly energetic runaways due to large current. The complex dynamics of the electron-electron collisions, including small angle collisions, is typically not included in analytic predictions nor in previous numerical techniques relying on the linear collision operator such as CODE. Here, we simulate REs using the NORSE (Non-linear Relativistic Solver for Electrons) code, which treats collisions in the plasma relativistically and non-linearly. We calculate runaway electron generation under varying initial temperatures and thermal quench rates for ITER like conditions, two important parameters affecting runaway generation. We compare NORSE calculations of the driven runaway current to predictions from analytical work in the literature and previous work with CODE.

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