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Runaway Electron Confinement Studies with NIMROD[1] V.A. IZZO, A.N. JAMES, J.H. YU, E.M. HOLLMANN, UCSD, P.B. PARKS, L.L. LAO, J.C. WESLEY, GA, D.G. WHYTE, G. OLYNYK, R.S. GRANETZ, MIT-PSFC — Simulations of disruptions in DIII-D, Alcator C-Mod and ITER are performed with NIMROD, using a test-particle orbit-integration module that calculates transport of runaway electrons on the NIMROD 3D fields as the current quench progresses. In the simulation, variation of plasma shape is studied to explore the experimental observation that limited, low-elongation plasmas confine runaways better than diverted plasmas. Cross-comparison of similar rapid shutdown scenarios in the three devices is performed to examine the effects of machine size and total plasma current and stored energy on confinement results. We also present comparisons of pellet-like and massive gas injection (MGI)-like rapid shutdown scenarios in C-Mod, and simulations with applied magnetic perturbations in DIII-D. Measurements of synchrotron emission and x-rays associated with runaway electrons are used to make direct connection between the simulation results and experiments in DIII-D and C-Mod.

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