

Abstract Submitted
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Runaway Electron Modeling Using Radiation Emitted From Impurity Pellets Injected in DIII-D¹ A.N. JAMES, E.M. HOLLMANN, G.R. TYNAN, UCSD, G.L. JACKSON, General Atomics — Energy and spatial distribution of runaway electrons generated during disruptions and fast shutdowns are important for understanding the formation, loss, and mitigation of runaway electrons to prevent catastrophic damage in future tokamaks like ITER and DEMO. Monte Carlo simulations were performed to investigate injection of impurity pellets during disruptions to diagnose runaways in DIII-D. Interaction of runaways with solid pellets, and of emitted γ -rays with the vessel walls and scintillators placed outside the walls, including photo-neutron, are simulated. Energy straggling of γ s passing through the vessel walls significantly skews the measured γ energy distribution; the spatial distribution of radiation associated with relativistic bremsstrahlung is found to provide good energy information in the expected runaway energy of 1-20 MeV. Temporal radiation intensity variations after pellet injection can reveal information on the spatial distribution of runaways. A proposed diagnostic using an array of 10-20 scintillators, and preliminary tests, will be presented.

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A.N. James
UCSD

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