Abstract Submitted
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Synchrotron and collisional damping effects on runaway electron distributions[1] C. PAZ-SOLDAN, General Atomics (GA), N. EIDIETIS, D. PACE, GA, C. COOPER, ORAU, D. SHIRAKI, N. COMMAUX, ORNL, E. HOLLMANN, R. MOYER, UCSD, R. GRANETZ, MIT, O. EMBREUS, T. FULOP, A. STAHL, G. WILKIE, Chalmers U, P. ALEYNIKOV, IPP, D.P. BRENNAN, C. LIU, PPPL — Validated models of runaway electron (RE) dissipation are required to confidently approve safe ITER $Q = 10$ operation. DIII-D experiments using quiescent REs are exploring the importance of synchrotron and collisional damping terms to RE dissipation. New time and energy-resolved measurements of RE bremsstrahlung hard X-ray (HXR) emission reveal stark differences between high and low energy REs as damping terms are varied. Previously reported anomalously high RE dissipation only applies to low energy REs. At high energy (where synchrotron effects are strongest) low synchrotron damping cases reach higher peak RE energy despite weaker particle confinement. Low-energy RE decay is observed concurrently with high-energy RE growth. RE dissipation models predict bump-on-tail distributions whose properties depend on the damping terms. Measured HXR spectra are very broad, as expected for bump-on-tail distributions.

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