

Abstract Submitted
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Investigation of runaway electron dissipation in DIII-D using a gamma ray imager.¹ A. LVOVSKIY, ORAU, C. PAZ-SOLDAN, N. EIDIETIS, D. PACE, D. TAUSSIG, General Atomics — We report the findings of a novel gamma ray imager (GRI) to study runaway electron (RE) dissipation in the quiescent regime on the DIII-D tokamak. The GRI measures the bremsstrahlung emission by RE providing information on RE energy spectrum and distribution across a poloidal cross-section. It consists of a lead pinhole camera illuminating a matrix of BGO detectors placed in the DIII-D mid-plane. The number of detectors was recently doubled to provide better spatial resolution and additional detector shielding was implemented to reduce un-collimated gamma flux and increase single-to-noise ratio. Under varying loop voltage, toroidal magnetic field and plasma density, a non-monotonic RE distribution function has been revealed as a result of the interplay between electric field, synchrotron radiation and collisional damping. A fraction of the high-energy RE population grows forming a bump at the RE distribution function while synchrotron radiation decreases. A possible destabilizing effect of Parail-Pogutse instability on the RE population will be also discussed.

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