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Design upgrades to the DIII-D gamma ray imager[1] A. LVOVSKIY, C.M. COOPER, ORAU, N.W. EIDIETIS, D. PACE, C. PAZ-SOLDAN, General Atomics — Generation of runaway electrons (RE) in tokamak disruptions can cause damage of plasma facing components. RE studies are necessary in order to provide a reliable mechanism of RE mitigation. For that task a gamma ray imager (GRI) has been developed for DIII-D. It measures the bremsstrahlung emission by RE providing information on RE energy spectrum and RE distribution across a poloidal cross-section. The GRI consists of a lead pinhole camera illuminating a 2D array of 30 BGO detectors placed in the DIII-D mid-plane. First results showed the successful measurements of RE energy spectra in the range 1 - 60 MeV with time resolution 100 μs. They have been obtained in the low-flux quiescent RE regime via pulse-high analysis. The measurements in the high gamma flux post-disruption RE regime showed strong signal saturation. Here we present GRI design upgrades towards signal attenuation and better detector shielding including Monte-Carlo Neutral Particle modeling of GRI irradiation, as well as improved calibration techniques and options to improve electronic noise rejection.

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