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Toroidal Asymmetry of Heat Deposition During Transient Events in DIII-D[1] C.J. LASNIER, W.H. MEYER, S.L. ALLEN, M.E. FENSTERMACHER, Lawrence Livermore National Laboratory — We show measurements of toroidal and poloidal distribution of heat from ELMs, disruptions, and magnetic perturbations; and outer-wall steady-state heating during diverted discharges, using a new wide-angle tangential viewing system for IR (and visible) emission. The IR data cover 3-5 μm, with 110 degrees of toroidal angle and full poloidal coverage of the wall, and complement the existing vertically viewing IR camera. Radial, poloidal, and toroidal profiles are extracted from images using a 3D model rendering that is warped to fit the real image. Wire-frame features are extracted from this rendering and aligned to the data image to determine the physical location viewed by each pixel. The IR data show that heat flux during ELMs forms multiple spiral stripes in the divertor, not inconsistent with expectations for an intermediate-n peeling/ballooning instability. Somewhat surprisingly, we observe volumetric emission from the inner wall during MARFEs, and also from the X-point area during disruptions. While not anticipated at 3-5 μm, these new data raise the prospect of imaging the dynamics of portions of the radiated power profiles during rapid transients.

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Charlie Lasnier
Lawrence Livermore National Laboratory

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