Abstract Submitted
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3-D radiation dynamics during gas jet mitigated disruptions on Alcator C-Mod[1] MATTHEW REINKE, ROBERT GRANETZ, IAN HUTCHINSON, DENNIS WHYTE, PLASMA SCIENCE AND FUSION CENTER, MIT TEAM — Demonstrating and understanding disruption mitigation (DM) techniques on present tokamaks is critical to the design of similar tools for ITER and beyond where a near zero-tolerance policy on unmitigated disruptions is envisioned. Efficient mitigation requires the bulk of the thermal and magnetic stored energy to be converted into radiation that is spread uniformly over the walls. Such uniformity has yet to be conclusively demonstrated or understood well enough to confidently design ITER's DM system. Using multiple AXUV diode arrays and spectroscopy, the toroidal and poloidal radiation distribution is investigated on Alcator C-Mod for DM experiments employing a high pressure gas jet. While large, time varying asymmetries in the radiation are observed, the total energy loss is shown to be nearly uniform. Prior to the onset of the thermal quench (TQ) it is shown that both radiation local to the gas jet and axisymmetric radiation are important in shedding the stored energy necessary to destabilize the MHD thought to trigger the TQ. The variation of this pre-TQ period with gas jet species and target plasma are discussed.

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