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Fast Time Response Electromagnetic Particle Injection System for Disruption Mitigation ROGER RAMAN, W-S. LAY, T.R. JARBOE, University of Washington, J.E. MENARD, M. ONO, PPPL — Predicting and controlling disruptions is an urgent issue for ITER. In this proposed method, a radiative payload consisting of micro spheres of Be, BN, B, or other acceptable low-Z materials would be injected inside the q=2 surface for thermal and runaway electron mitigation. The radiative payload would be accelerated to the required velocities (0.2 to >1km/s) in an Electromagnetic Particle Injector (EPI). An important advantage of the EPI system is that it could be positioned very close to the reactor vessel. This has the added benefit that the external field near a high-field tokamak dramatically improves the injector performance, while simultaneously reducing the system response time. A NSTX-U / DIII-D scale system has been tested off-line to verify the critical parameters - the projected system response time and attainable velocities. Both are consistent with the model calculations, giving confidence that an ITER-scale system could be built to ensure safety of the ITER device. This work is supported by U.S. DOE Contracts: DE-AC02-09CH11466, DE-FG02-99ER54519 AM08, and DE-SC0006757.

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