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Spectroscopic Investigation of Disuptions on DIII–D,[1]
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— We report on the characterization of DIII–D disruptions using fast XUV and X–ray spectroscopy on DIII–D. Plasma discharges terminated with a "killer" pellet of neon or argon are the main focus of our studies. An XUV SPRED spectrometer provides high time resolution of the total radiated power, as well as information on the average charge state and electron temperature of the highly radiative plasma. We observe that neon killer pellet disruptions radiate up to ≈100% of their stored thermal energy and that the average temperature of the core decreases to below 100 eV within 2 ms. Soft X–ray photodiodes are used to characterize the thermal quench of argon induced disruptions (gas injection or killer pellet) via the measurement of argon K-alpha line radiation. This technique may also be applied to study the location and confinement of suprathermal electrons via their collisional excitation of the K-alpha radiation in a thermally cold plasma.

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