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Effect of plasma elongation on disruption runaway electrons[1]
ROBERT GRANETZ, DENNIS WHYTE, MIT Plasma Science and Fusion Center, VALERIE IZZO, UCSD — Studies of runaway electron (RE) populations during disruptions on a number of different tokamaks have shown two distinctly different types of behavior: (a) some machines tend to observe RE's during a significant number of current quenches, and (b) some machines rarely observe RE's during the disruption current quench. Of those that do see runaways, a general trait is that they run circular or low elongation and/or limited discharges (FTU, Tore-Supra, TEXTOR, JT-60U), and conversely, those that don't see runaways tend to run elongated, diverted discharges (C-Mod, DIII-D, ASDEX-U). This suggests that elongation and/or vertical stability might play a role in RE confinement during disruptions. An experiment to test this hypothesis on Alcator C-Mod uses lower hybrid current drive to generate a strong RE population, and gas jet injection to trigger reproducible disruptions. Behavior of runaways during disruptions in both low elongation and high elongation equilibria are compared. Experimental findings will be presented and compared to NIMROD modeling predictions, and implications for ITER will be discussed.

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Robert Granetz
MIT Plasma Science and Fusion Center

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