

Abstract Submitted  
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**Suppression of Tearing Modes by RF Current Condensation<sup>1</sup>** A.

REIMAN, N. FISCH, Princeton Plasma Physics Laboratory — We describe a previously unrecognized effect that can significantly facilitate the stabilization of magnetic islands by RF driven currents [1]. Analyses of stabilization have generally assumed that the local electron acceleration is unaffected by the presence of the island. This neglects the sensitivity of the deposition to the temperature, with the temperature in the island perturbed by the power deposition. The nonlinear feedback on the power deposition increases the temperature perturbation, and it can lead to a bifurcation of the solution to the steady-state heat diffusion equation. The combination of the nonlinearly enhanced temperature perturbation with the rf current drive sensitivity to the temperature leads to the rf current condensation effect. A recent calculation has confirmed the appearance of a hysteresis effect, with stabilized islands shrinking to smaller widths than would otherwise be achieved [2]. The threshold for the condensation effect is in a regime that has been encountered in experiments, and will likely be encountered in ITER. The potential impact on disruptivity will be discussed. [1] A. Reiman and N. Fisch, Phys. Rev. Lett. 121, 225001 (2018). [2] E. Rodriguez, A. Reiman and N. Fisch, poster, this meeting.

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