

Abstract Submitted  
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**Effects of Magnetic Island  
Geometry on RF Current Condensation<sup>1</sup>**

JESSICA LI, Princeton University,  
ALLAN REIMAN, NAT FISCH, Princeton Plasma Physics Lab — Radio frequency (RF) current drive is a known method for stabilizing magnetic islands in tokamaks. Experimental studies have confirmed the stabilizing effects of RF wave heating and current drive, but corresponding analytic and numerical models have only recently accounted for the effects of nonlinear feedback on the island current and temperature profiles [1]. Recent 1D calculations including wave depletion have confirmed the existence of an associated hysteresis effect [2]. We present the results of numerical solutions of the nonlinear steady-state thermal diffusion equation, including wave depletion, in full magnetic island geometry. The conditions under which there are significant nonlinear effects on the temperature profile are determined, and thresholds for bifurcation and hysteresis are calculated. The cases for both rotating and locked islands are considered. [1] A. H. Reiman and N. J. Fisch, Phys. Rev. Lett. **121**, 225001 (2018). [2] E. Rodriguez, A. Reiman and N. Fisch, to be submitted.

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Jessica Li  
Princeton University

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