Abstract Submitted
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Locked Mode stabilization in ITER[1] RICHARD NIES, ALLAN H. REIMAN, EDUARDO RODRIGUEZ, Princeton University, Princeton Plasma Physics Laboratory, NICOLA BERTELLI, Princeton Plasma Physics Laboratory, NATHANIEL J. FISCH, Princeton University, Princeton Plasma Physics Laboratory — A strategy of stabilizing locked rather than rotating modes is shown to reduce the EC power requirementin ITER, also being less sensitive to radial misalignment and beam broadening. The short locking time in ITER [1] suggests attention might best be redirected to stabilizing locked modes, which was pioneered experimentally in [2] but received comparatively little attention. The power requirements for rotating and locked mode stabilization scenarios in ITER are obtained by simultaneously evolving the island width and rotation. The results motivate a reevaluation of the optimal EC toroidal launching angle. Finally, we show how current condensation [3] helps to stabilize large locked islands, by self-consistently modeling the power deposition using ray-tracing and the island temperature [4]. [1] La Haye et al. Effect of thick blanket modules on neoclassical tearing mode locking in ITER. NF 57, 014004 (2017) [2] Volpe et al. Avoiding Tokamak Disruptions by Applying Static Magnetic Fields That Align Locked Modes with Stabilizing Wave-Driven Currents. PRL 115 (2015)[3] Reiman Fisch. Suppression of Tearing Modes by Radio Frequency Current Condensation. PRL 121, (2018) [4] Nies et al. Calculating RF current condensation with self-consistent ray-tracing. Submitted to PoP (2020)

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