Abstract Submitted
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Challenges for Robust Feedback Stabilization of ELM-Driven Resistive Wall Mode (RWM)[1] M. OKABAYASHI, H. TAKAHASHI, PPPL, A.M. GAROFALO, H. REIMERDES, M.J. LANCTOT, Columbia U., G.L. JACKSON, R.J. LA HAYE, E.J. STRAIT, GA, Y. IN, J. KIM, FAR TECH Inc. — The RWM can be stabilized by modest plasma rotation. However, even when plasma rotation is well above the critical value, MHD activities such as ELMs and Fishbones excite RWMs. Feedback plays several crucial roles against RWM onset. Minimizing the amplification of residual error fields due to MHD events is the first necessary step for providing robust feedback RWM stabilization. Below the no-wall β_N limit, feedback can reduce the residual n=1 RWM amplitude and consequently the amplification is reduced as indicated by the edge T_i. Near the high β_N operational limit, ELM events suddenly increase the amplitude of stable RWM resonating with residual error field, presumably triggered by the n=1 component of ELM or by the rapid change of the RWM mode pattern during ELMs. The existence of finite amplitude leads to fast unstable RWM growth. When the feedback can completely reduce the resonant process, high β plasmas remain stable.

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M. Okabayashi
PPPL

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