

**Abstract Submitted for the Forty-Eighth Annual Meeting  
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Category Number and Subject:

Theory      Experiment

**n>1 Resistive Wall Mode (RWM) Identification,\*** J. Kim, Y. In, J.S. Kim, *FAR-TECH, Inc.*, M. Okabayashi, *PPPL*, H. Reimerdes, A.M. Garofalo, *Columbia U.*, E.J. Strait, *GA*, and DIII-D Thrust 4 Team – Resistive wall mode studies in DIII-D demonstrated the effectiveness of n=1 RWM feedback control beyond n=1 no-wall  $\beta$  limit, where  $\beta$  is the ratio between plasma pressure and magnetic pressure. However it is predicted that, as  $\beta$  increases, not only n=1 RWM but also n>1 RWM may become unstable. The presence of n=3 mode on top of n=1 mode has been observed in some recent DIII-D RWM shots. In order to accurately identify n>1 RWM, a set of matched filters associated with n>1 RWM is under development using the same method as developed for n=1 matched filter [1]. Specifically, based on the magnetic perturbations of each toroidal mode on plasma surface, the FARVAC code calculates the estimated signals for magnetic sensors to construct n>1 RWM matched filter. Along with the n=1 RWM matched filter, we plan to use these n>1 RWM matched filters to provide a more complete RWM identification to achieve higher  $\beta$  operation.

[1] D.H. Edgell, et al., *Rev. Sci. Instrum.* **73**, 1761 (2002).

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