

**Abstract Submitted for the Forty-Eighth Annual Meeting
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Category Number and Subject: 5.6.2. DIII-D Tokamak

[] Theory [X] Experiment

Resistive Wall Mode (RWM) Identification and Feedback Control Using Eigenmode-Based DIII-D/RWM Model,* Y. In, J.S. Kim, J. Kim. *FAR-TECH. Inc.*, M.S. Chu, D.A. Humphreys, G.L. Jackson, R.J. La Haye, R.D. Johnson, E.J. Strait, M.L. Walker, A.S. Welander, *GA*, A.M. Garofalo, H. Reimerdes, *Columbia U.*, M. Okabayashi, *PPPL* – Recent DIII-D experiments demonstrated that a model-based dynamic Kalman filter scheme, in which the wall is modeled as composed of “picture frames,” was effective in discriminating edge localized modes (ELMs) from resistive wall mode (RWM). A newly developed DIII-D/RWM model using a “wall surface current eigenmode” approach was predicted to be not only more effective in RWM identification but also more efficient in the feedback control [1]. Specifically, this eigenmode approach helps to identify RWMs more accurately with fewer wall states than in the picture frame model, reducing computation time without sacrificing the accuracy. Several controllers are under development based on this eigenmode approach.

[1] Y. In *et al.*, *Phys. Plasmas* **13**, 062512 (2006).

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