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Category Number and Subject:

[ ] Theory [X] Experiment

Model-based RWM Identification, ELM-Filtering, and RWM Control on the DIII-D Tokamak,* Y. In, J.S. Kim, *FAR-TECH, Inc*., M.S. Chu, J.R. Ferron, D.A. Humphreys, G.L. Jackson, R.J. La Haye, R. Johnson, J.T. Scoville, E.J. Strait, A.D. Turnbull, M.L. Walker, *GA*, A.M. Garofalo, H. Reimerdes, *Columbia U*., M.S. Chance, M. Okabayashi, *PPPL* – Resistive-wall-mode (RWM) modeling helps not only to identify the RWM mode, but also to optimize model-based control. Based on modeled sensor signals, a static matched filter is constructed to identify the RWM mode. Using a "picture frame" wall model, a dynamic Kalman filter has been developed to discriminate edge localized modes (ELMs) from RWMs. From this ELM-filtered RWM mode identification, an enhanced RWM feedback controller has been implemented for DIII-D plasmas. Recent experiments showed the effectiveness of the Kalman filter scheme; the feedback coils were rarely excited during ELMs, while responding to RWMs. To investigate proper RWM responses, an optimized Kalman filter parameter set has been found and evaluated. Meanwhile, using a thin wall treatment, an eigenmode approach has been adopted to represent the vessel more accurately.

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[ ] Oral [x] Poster