Overview and Plan of FAR-TECH RWM Identification Via Kalman Filter and Implementation of Model-Based Feedback Control,* J.S. Kim, Y. In, I.N. Bogatu, J. Kim, FAR-TECH, Inc., M.S. Chu, D.A. Humphreys, G.L. Jackson, R. Johnson, R.J. La Haye, E.J. Strait, M.L. Walker, A.S. Welander, GA, A.M. Garofalo, H. Reimerdes, Columbia U., M. Okabayashi, PPPL – FAR-TECH is developing, implementing, and validating real-time resistive-wall-mode (RWM) identification algorithms and model-based RWM feedback algorithms on DIII-D. For RWM identification, a numerically simulated spatial pattern of the sensor signals (matched filter) can be matched to the measured sensor signals in real-time. Temporal behavior of the RWMs is further utilized by a Kalman filter in the identification to discriminate them from other noise/modes, i.e. edge localized modes. We will present modeling of the RWM signals at sensor locations by FARVAC, implementation of RWM identification algorithms on DIII-D, internal RWM mode structure identification, feedback controller algorithms, and ongoing validation results. Our new effort on identification of RWMs with toroidal modes for n>1 will be discussed.

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