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Overview and Plan of FAR-TECH RWM Identification Via Kalman Filter and Implementation of Model-Based Feedback Control, ¹ J.S. KIM, Y. IN, I.N. BOGATU, J. KIM, FAR-TECH. Inc., M.S. CHU, D.A. HUMPHREYS, G.L. JACKSON, R.D. 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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