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Results from an International MHD Data Mining Collaboration B.D. BLACKWELL, D.G. PRETTY, Australian National University, S. YAMAMOTO, K. NAGASAKI, Institute of Advanced Energy, Kyoto University, Japan, E. ASCASIBAR, R. JIMENEZ-GOMEZ, Laboratorio Nacional de Fusion, EURATOM-CIEMAT, Spain, S. SAKAKIBARA, National Institute for Fusion Science, Japan, F. DETERING, Diversity Arrays Technology P/L, Canberra, Australia
— New data mining techniques have been successfully applied to MHD data on H-1, TJ-II and Heliotron-J, and are being implemented on LHD and W-7AS data. The motivation for automated mining of fusion databases is to distil and classify data for inclusion in fusion physics databases, and to highlight physically-interesting, previously unnoticed modes. We present results from data mining of more than 10,000 shots from H-1, TJ-II and Heliotron J, showing a range of Alfvénic and non-Alfvénic modes, many with well-defined poloidal mode structure and clear relation to heating configuration and plasma geometry. In the case of H-1, the dispersion relations for several of these modes have been examined in detail exploiting H-1's high resolution in rotational transform. Examples of use of this relation to provide information about rotational transform (a form of Alfven spectroscopy) are given. We also discuss possible real-time application of the cluster technique to preliminary mode identification as data is being acquired, and some initial work on application of image processing techniques to MHD spectrogram analysis.

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