Abstract Submitted for the DPP15 Meeting of The American Physical Society

Prospects for MHD Spectroscopy in Disruption Avoidance¹ A.D. TURNBULL, F. TURCO, J.D. HANSON, N.M. FERRARO, L.L. LAO, GA -MHD spectroscopy has been shown experimentally to reveal the presence of stable Alfvén eigenmodes and simulations using the MARS-F code have shown that the spectroscopy scan can be modeled. The peaks in the response impedance reveal the frequencies corresponding to normal modes of the plasma and the width of the peak is a measure of the damping. The same techniques can be used to probe lower frequencies to investigate ideal MHD kink instabilities near marginal stability. MARS-F is used to probe the stable spectrum. It is well known that the ideal MHD spectrum consists of a pair of stable continua corresponding to the shear Alfvén and acoustic waves, and a discrete unstable component. When the equilibrium is Mercier unstable, a Sturmian sequence of unstable modes is also present with an accumulation point at the edge of the continuum. Discrete marginally stable kink modes also exist within gaps in the continua. The ultimate aim is to evaluate proximity to stability limits and develop techniques to steer the equilibrium away from those limits.

¹Supported by US DOE under DE-FC02-04ER54698.

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Date submitted: 27 Oct 2015

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