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Damping Rates of Energetic Particle Modes and Stability With Changing Equilibrium Conditions in the MST Reversed-Field Pinch S.H. SEARS, A.F. ALMAGRI, J.K. ANDERSON, P.J. BONOFIGLO, W. CAPECCHI, J. KIM, University of Wisconsin-Madison — The damping of Alfvenic waves is an important process, with implications varying from anomalous ion heating in laboratory and astrophysical plasmas to the stability of fusion alpha-driven modes in a burning plasma. With a 1 MW NBI on the MST, a controllable set of energetic particle modes (EPMs) and Alfvenic eigenmodes can be excited. We investigate the damping of these modes as a function of both magnetic and flow shear. Typical EPM damping rates are -10^4 s^{-1} in standard RFP discharges. Magnetic shear in the region of large energetic ion density is -2 cm^{-1} and can be increased up to -2.5 cm^{-1} by varying the boundary field. Continuum mode damping rates can be reduced up to 50%. New experiments use a bias probe to control the rotation profile. Accelerating the edge plasma relative to the rapidly rotating NBI-driven core decreases the flow shear, while decelerating the edge plasma increases the flow shear in the region of strong energetic ion population. Mode damping rates measured as a function of the local flow shear are compared to ideal MHD predictions. Work supported by US DOE.

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