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MHD Mode Rotation and Amplitude Changes Induced by a Biased Electrode and Applied Resonant Magnetic Perturbations B. DEBONO, J.P. LEVESQUE, M.E. MAUEL, D.A. MAURER, G.A. NAVRATIL, T.S. PEDERSEN, N. RATH, D. SHIRAKI, Columbia University — The effect of plasma rotation on the behavior of MHD modes is a topic of importance for both resistive wall and tearing mode stability. On HBT-EP, a biased molybdenum electrode inserted into the edge plasma is used to change the intrinsic ExB rotation of MHD activity of both kink and tearing mode fluctuations and magnetic torque is applied by currents in control coils to effect mode rotation and amplitude. Applied resonant magnetic fields have been observed to lead to characteristic mode amplitude modulations due to the applied slowing torque. For large applied bias voltage, kink fluctuations are observed to accelerate in the direction opposite to the naturally occurring mode rotation with frequencies up to two or three times the natural rotation rate. With the use of strong edge biasing, large (n,m)=(3,1) external kink modes are observed to change their rotation rate from +4 kHz to -30 kHz. At these velocities, the conducting wall segments behave like an ideal wall with a small amplitude rotating ideal kink mode still observable. Magnetic analysis of the behavior of the external kink under these fast rotating conditions will be discussed. Supported by U.S. DOE Grant DE-FG02-86ER53222.

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