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The Effects of Neutral Damping on Resistive Wall Mode Physics
R. JAMES, US Coast Guard Academy/Stevens Institute of Technology, K. BECKER, Stevens Institute of Technology, J. HANSON, M.E. MAUEL, D.A. MAUER, G.A. NAVRATIL, T.S. PEDERSEN, N. STILLITS, Columbia University
— The physics of the dissipation mechanism responsible for rotational stabilization of the resistive wall mode (RWM) is an object of intense current research. On HBT-EP, there is experimental evidence that edge neutral damping is a significant dissipation mechanism that affects tearing mode behavior [1]. To quantify the possible effect of neutral damping on RWM physics, we are constructing a 16-channel linear photo-detector array to measure D_α emission and its fluctuations. These measurements will be used in conjunction with a 1D space, 2D velocity kinetic transport model of the atomic and molecular deuterium penetration to quantify neutral profiles within the plasma [2]. Ongoing efforts to measure the neutral damping contribution to RWM rotational stabilization utilizing the measured D_αg profiles to estimate the edge neutral density will be presented. *Supported by U.S. DOE Grant DE-FG02-86ER53222 1 E. D. Taylor, *et al.*, *Phys. Plasmas* **9**, 3938 (2002) 2 B. LaBombard, MIT PSFC RR-00-9, (2000).

R. James
US Coast Guard Academy/Stevens Institute of Technology

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