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Modeling ECCD/MHD coupling using NIMROD, GENRAY, and the Integrated Plasma Simulator THOMAS G. JENKINS, D.D. SCHNACK, C.R. SOVINEC, C.C. HEGNA, J.D. CALLEN, F. EBRAHIMI, UW-Madison, S.E. KRUGER, J. CARLSSON, Tech-X, E.D. HELD, J.-Y. JI, Utah State U., R.W. HARVEY, A.P. SMIRNOV, CompX, W.R. ELWASIF, ORNL, SWIM PROJECT TEAM — We summarize ongoing theoretical/numerical work relevant to the development of a self–consistent framework for the inclusion of RF effects in fluid simulations; specifically, we consider the stabilization of resistive tearing modes in tokamak geometry by electron cyclotron current drive. In the fluid equations, ad hoc models for the RF–induced currents have previously been shown to shrink or altogether suppress the nonlinearly saturated magnetic islands generated by tearing modes; progress toward a self–consistent model is reported. The interfacing of the NIMROD [1] code with the GENRAY/CQL3D [2] codes (which calculate RF propagation and energy/momentum deposition) via the Integrated Plasma Simulator (IPS) framework [3] is explained, RF-induced rational surface motion and the equilibration of RF–induced currents over plasma flux surfaces are investigated, and the efficient reduction of saturated island widths through time modulation and spatial localization of the ECCD is explored. [1] Sovinec *et al.*, JCP **195**, 355 (2004) [2]www.compxco.com [3] Both the IPS development and the research presented here are part of the SWIM project. Funded by U.S. DoE.

Thomas G. Jenkins
UW-Madison

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