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Nonlinear Modeling of ELMs with the NIMROD Code D.P. BRENNAN, University of Tulsa, D.D. SCHNACK, C.R. SOVINEC, University of Wisconsin, E.D. HELD, Utah State University, R.A. BAYLISS, University of Wisconsin — Understanding how to obtain the high performance of the ELMy H-mode regime while minimizing the deleterious effects of ELMs is an important problem facing the fusion community. Theoretical progress in understanding of ELMs has been made by investigating the stability boundaries of the peeling-ballooning mode using an ideal MHD model [1,2]. Nonlinear extended MHD codes offer the possibility of improving these studies by allowing; e.g., studies of the nonlinear spectral energy transfer, and propagation of plasma energy into the region of open field lines. In addition, because these codes do not rely on an ideal MHD ballooning-type formulation, implementation of additional effects such as resistivity, other diffusivities, and two-fluid effects are more straightforward to implement; however the challenges are that a strict vacuum formulation is not possible and the ability simulate the both the hot plasma, closed field-line region and the cold plasma, open-field line region presents many numerical difficulties. In this work, we present analysis of recent NIMROD nonlinear runs, in particular with the evolution of the magnetic topology and heat deposition on the walls. [1] P. B. Snyder et.al., Phys. Plasm. 9, 2037 (2002) [2] H. R. Wilson et.al., Phys. Plasm. 9, 1277 (2002)

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