

Abstract Submitted
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MHD and 2-Fluid Stability of DIII-D Shot #96043 using the NIMROD Code¹ DALTON SCHNACK, University of Wisconsin, SCOTT KRUGER, TechX Corp., C.C. KIM, University of Washington, ALAN TURNBULL, General Atomics — DIII-D shot #96043 exhibits sawtooth free periods during NB/RF heating. These periods are terminated by “giant sawtooth” crashes. This discharge has formed the basis for computational evaluation of the Porcelli model [1]. We have begun [2] to use this discharge in a verification and validation campaign for energetic particle model the NIMROD code [3]. The ability to perform and understand resistive and extended MHD computations is necessary for a proper V & V study of the energetic particle model. At $t=1900$ msec, unstable modes are the 1/1 ideal kink mode, a resistive 2/2 mode and a number of high-n localized rippling modes with $q \sim 3$ (near the separatrix). With resistive MHD the high-n modes can be stabilized by a combination of viscosity profile and anisotropic thermal conductivity. When 2-fluid are introduced new high-n localized mode appear. Linear results for all models and nonlinear results for resistive MHD are presented. [1] M. Choi, A. D. Turnbull, V. S. Chan, et al., Phys. Plasmas 14, 112517 (2007). [2] D. D. Schnack, et al., Bull. Am. Phys. Soc. 54, paper S1.00056 (Abstract Only) (2009). [3] C. C. Kim and the NIMROD Team, Phys. Plasmas 15, 072507 (2008).

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