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Gyrokinetic simulations of Reverse Shear Alfven Eigenmodes in DIII-D plasmas SCOTT PARKER, YANG CHEN, TOBIN MUNSAT, University of Colorado at Boulder, MICHAEL VAN ZEELAND, WILLIAM HEIDBRINK, General Atomics, BENJAMIN TOBIAS, Princeton Plasma Physics Lab, CALVIN DOMIER, University of California, Davis — A gyrokinetic ion/mass-less fluid electron hybrid model as implemented in the GEM code[1] is used to study the Reverse Shear Alfven Eigenmodes (RSAE) observed in DIII-D, discharge 142111. This is a well diagnosed case with measurement of the core-localized RSAE frequency chirping and mode structure. Simulations reproduce many features of the observation, including the mode frequency up-chirping in time and the chirping range. A new algorithmic feature is acdded to the GEM code for this study. Instead of the gyrokinetic Poisson equation itself, its time derivative, or the vorticity equation, is solved to obtain the electric potential, and this permits a numerical scheme that ensures the ExB convection of the equilibrium density profiles for each species cancel each other in the absence of any finite-Larmor-radius effects. These nonlinear simulations generally result in an electron temperature fluctuation level comparable to measurements, but the mode frequency has a spectrum broader than the experimental spectrum. The spectral width from simulations can be reduced if less steep beam density profiles are used, meanwhile the experimental fluctuation level can still be reproduced if

[1]Y. Chen and S. E. Parker, J. Comp. Phys. 220, 837 (2007)

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