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Diamagnetic Effects on Double Tearing Modes in Hall-MHD and PIC Simulations STEPHEN ABBOTT, KAI GERMASCHEWSKI, AMITAVA BHATTACHARJEE, CICART, University of New Hampshire — Reversed magnetic shear configurations hold promise to stabilize pressure-driven modes in tokamaks and allow for higher pressures and improved confinement, however they give rise to tearing instabilities. We extend recent work on the properties of the double tearing mode (DTM) in collisional as well as collisionless regimes in the presence pressure gradients that drive diamagnetic flows using both Hall MHD and PIC simulations. Diamagnetic drifts act to shift the growing islands relative to each other, competing against the locking mechanism that usually drives fast DTM dynamics. We address the following questions: In the weak coupling limit, does diamagnetic stabilization remain similar to what we have observed previously for the m=1 mode? In the strong coupling limit, can diamagnetic effects suppress the strong DTM dynamics? Our preliminary results indicate significant differences from recent resistive MHD simulations of this problem in the literature.

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