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Two-fluid simulations of drift-Alfven instability associated with turbulence in high beta plasmas using the BOUT++ code for the newly upgraded Large Plasma Device BYONGHOON SEO, TROY CARTER, University of California, Los Angeles — We present results from numerical simulations using the BOUT++ code, which is a 3D, fluid simulation developed for studying plasma instabilities and turbulence[1]. The simulations were executed in the condition of the Large Plasma device (LAPD) at UCLA involving electromagnetic contribution and high beta regimes where beta >0.1, a ratio of thermal pressure to magnetic pressure. The high beta regimes are relevant to the newly upgraded LAPD with a new LaB6 cathode in addition to the existing LaB6 cathode so as to have accessibility to a wider range of plasma betas in a laboratory plasma. This work would not only extend the previous work that was performed in the low beta, electrostatic condition[2] but also explore how drift waves couple to Alfven waves in the high beta, electromagnetic condition and provide a new window that could potentially be observed in the newly upgraded LAPD. In addition, results obtained in the regime where a cross-field shear flow is driven by externally biasing will be discussed in the regimes. [1] M.V. Umansky, et. al., Computer Physics Communication, 180, 887-903 (2009) [2] P. Popovich, et. al., Physics of Plasmas, 17, 122312, (2010) Work performed at the Basic Plasma Science Facility, which is funded by the US DoE and NSF

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