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**Hall and gyro-viscous effects to the Rayleigh-Taylor instability in a 2D slab** RYOSUKE GOTO, The Graduate University for Advanced Studies (SOKENDAI), HIDEAKI MIURA, ATSUSHI ITO, MASAHIKO SATO, National Institute for Fusion Science, TOMOTOHARU HATORI, The Graduate University for Advanced Studies (SOKENDAI) — Small scale effects such as the Finite Larmor Radius (FLR) effect and the Hall term which are ignored in the single-fluid MHD model can be important for the growth of the high wave number unstable modes such as the ballooning instability. Here we consider a simple Rayleigh-Taylor (R-T) instability in a 2D slab, and study the effect of the Hall term and the FLR effect to the R-T instability. The FLR effect is modeled as the gyro-viscous tensor [1, 2]. It is shown that the linear growth rate of the high wave number modes are reduced by the FLR effect and increased by the Hall term. However, when the Hall term and the FLR effect are added simultaneously, high wave number modes are strongly reduced. We will compare results of linear stability analysis to those of nonlinear simulations, and study some aspects of nonlinear growth under the effect of the FLR and the Hall terms by the use of an appropriate index such as the mixing width. In the Hall case, mixing width is slightly increased compared with MHD case. However growth rate reduces when the Hall term and the gyro-viscosity are added simultaneously, mixing width reaches comparable level with MHD case.

[1] S. I. Braginskii, Rev. Plasma Phys., 1, 205 (1965).
[2] P. Zhu et al., Phys. Rev. Lett., 101, 085005 (2008).

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