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Extended MHD Simulation of Kelvin-Helmholtz Instability in a 2D Slab TOMOHARU HATORI, The Graduate University for Advanced Studies, HIDEAKI MIURA, ATSUSHI ITO, MASAHIKO SATO, National Institute for Fusion Science, RYOSUKE GOTO, The Graduate University for Advanced Studies — Shear flow of plasma in magnetic confinement fusion devices can play important roles to achieve high-performance plasma.On one hand, it can improve plasma confinement.On the other hand, it can cause magnetohydrodynamic (MHD) instabilities such as Kelvin-Helmholtz (KH) instability.Although KH instability has been researched intensively in a (single-fluid) MHD theory, the effects of the ion inertia length (two-fluid effect) or finite Larmor radius (FLR effect) to KH modes have not yet been well investigated, especially for parameters suitable for magnetically confined plasmas.These small scale effects are important when the shear is strong, e.g. in the edge region of H-mode tokamaks.In this study, numerical simulations of the KH instability in a 2D slab are carried out by our nonlinear extended MHD code.Evolution of KH modes due to sheared-flow perpendicular to an equilibrium magnetic field is concerned.Two-fluid terms show stabilizing effect, while FLR terms destabilizing. Wave numbers that growth rates are affected by those effects vary by beta, which correspond to the ratio of the Larmor radius to the ion inertia length. Discussion about nonlinear evolution and saturation will be presented.

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