Comparison of kinetic MHD simulation results between gyrokinetic PIC and gyro-reduced-MHD codes[1] HIROSHI NAITOU, KENICHI KOBAYASHI, HIROKI HASHIMOTO, TAKEHISA ANDACHI, Yamaguchi University, SHINJI TOKUDA, JAEA, MASATOSHI YAGI, Kyushu University — To understand the MHD phenomena which can be explained only by extended or kinetic MHD simulation is crucial in tokamak experiments. We have developed a Gpic-MHD code and a GRM code. Gpic-MHD code is the electromagnetic gyrokinetic particle-in-cell code with delta-f method and specialized for MHD. GRM code is the gyro-reduced-MHD code based on the equations for the electrostatic potential, the longitudinal component of the vector potential, the electron density, the ion fluid velocity along the magnetic field, and the perturbed ion temperature. The equation for the perturbed ion temperature is added to include the ion Landau damping effect Both codes have single and multi- helicity versions. The simulation results of m/n=1/1 kinetic internal kink mode are compared. Gpic-MHD results are more stable than GRM results because the shifted electron Maxwell distribution used in the Gpic-MHD code includes anisotropy in the pressure term. Parallelization performance will be presented as well as the discussion about incorporating advanced algorithms such as a split-weight-scheme to the Gpic-MHD code.

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