Toward the Development of a New MHD Code for Fusion Plasma

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Abstract

Development of a new code for magnetohydrodynamic (MHD) phenomena in fusion plasma is under progress. The code implements the Finitie Volume Method (FVM) to follow conservative quantities such as the energy and momentum using a high-order scheme (WENO5). This approach is different from those of existing codes, such as NIMROD and M3D, which use the Finite Element Method. The boundary and geometry of tokamak are hard to be described in orthogonal coordinates. Therefore, it is non-trivial to implement FVM to codes for fusion plasma in tokamak. However, employing new numerical schemes and techniques to handle the geometry and boundary condition, we expect to resolve obstacles in codes with FVM. Here we introduce what we have done and a future plan for the code development.