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GTC Simulation of Tearing Modes in Fusion Plasmas DONGJIAN LIU, College of Physical Science and Technology, Sichuan University, IHOR HOLOD, University of California, Irvine, WENLU ZHANG, Institute of Physics, Chinese Academy of Sciences, ZHIHONG LIN, University of California, Irvine —
In Tokamak discharge, Tearing modes are very important modes which may cause the disruption and sawtooth crash. For the reason, an effective physics model and corresponding simulation code are needed to study these modes. We have modified the fluid-kinetic hybrid electron model used in Gyro-kinetic Toroidal Code (GTC) and developed both resistive and finite mass electron fluid model for tearing mode simulations. Using the model in GTC, we have successfully recovered linear behavior of both the classical resistive tearing mode and the collisonless tearing mode, and verified the capability of GTC to study this mode. The modified GTC may supply a more powerful implement for kinetic-MHD study of Tokamak plasma.

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