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Finite Volume Simulation of Arc Plasmas

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Abstract

In many problems, arc plasmas are treated as the fluid with finite electric conductivity. The finite volume method (FVM) has been proved to be an effective numerical method for simulating arc plasmas, especially for the description of their macroscopic behaviors. Our simulation code for arc physics is developed based on FVM and SIMPLE algorithm for solving plasma pressure. The discretization of Navier-Stokes equation is introduced. Several numerical cases are simulated using the new code for benchmark, which show that the simulation results agree with analytical ones very well. The new code provides a fundamental tool for the further investigation of arc physics.

References

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