

# The Stability of an IMEX (Implicit-Explicit) Method for Simplified MHD (MagnetoHydroDynamics) Equations

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## Abstract

Magnetohydrodynamics (MHD) studies consider the dynamics of electrically conducting fluids. MHD are described by a set of equations, which are a combination of the Navier–Stokes equations of fluid dynamics and Maxwell’s equations of electromagnetism [1]. In most terrestrial applications, MHD flows occur at low magnetic Reynolds numbers. In this study, we apply the finite element method to time-dependent MHD flows with implicit-explicit (IMEX) method to discretization at low magnetic Reynolds number. We introduce an imex (implicit-explicit) method for time discretization and also finite element method for space discretization [2, 3]. Finally, the stability of the present method is presented comprehensively.

*Key words:*

Magnetohydrodynamics, Imex methods, Finite Element Method,

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## References

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