# Numerical Algorithms for Modeling MHD Flows at Low and High Magnetic Field
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## ABSTRACT

We develop new numerical algorithms for low and high magnetic field to be applied on magnetohydrodynamics (MHD), magnetoconvection and plasma turbulence problems. We assess the validity of our numerical approaches and methods via previously proven concepts on simpler cases. We also validate such methods using some theoretical approaches; the global asymptotic analysis methods. The numerical algorithms employ variational and quasi variational inequality methods. We hence apply and discuss our approaches for the nonlinear turbulent flows.

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