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# On the Magnetohydrodynamic Equations under different boundary conditions for the velocity and the magnetic field

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## Résumé

The boundary value problem for the steady-state magnetohydrodynamic (MHD) equations under various boundary conditions for the velocity and the magnetic field is considered in a bounded domain. First, we state the case in which the tangential components of the velocity and the magnetic field are specified on the boundary together with a pressure boundary condition. We give some results of existence, uniqueness and regularity of solutions in the Hilbertian case and in  $L_p$  theory. Next, we propose and analyze a mixed discontinuous Galerkin (DG) method for the (MHD) equations with Navier type boundary conditions for the velocity and the magnetic field. With new discrete Sobolev embedding type estimates for the discontinuous polynomials, we provide a priori error estimates for the method.

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