

The MHD model

The **magnetohydrodynamic (MHD) model** is used to describe plasma with a set of fluid equations coupled with Maxwell equations. The MHD models relies on the main assumption of **collisional plasma**, even though it is sometimes applied to dynamics of almost collisionless tokamak plasmas. The MHD model is used to describe **long-wavelength** and **low-frequency** dynamics in a macroscopic single fluid plasma, and this is usually the case for the perpendicular dynamics of macroscopic instabilities, which is quite slow compared to the dynamics along the parallel direction.

The ideal MHD model

In the ideal MHD model the plasma is considered to have **zero resistivity**, allowing the magnetic field lines to freeze in the plasma. The set of equation used is the following: