

# 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: