

Abstract:

The relation between parallel viscosity and the parallel conductivity for tokamak plasma has been derived by combining Ideal MHD equilibrium equations with the concept of universal profiles. It is obtained that the parallel viscosity Π_{\parallel} and parallel conductivity σ_{\parallel} in a tokamak are related by $\Pi_{\parallel} \sigma_{\parallel}^{-1} = \gamma (U - U_0)I/R$, where U is the loop voltage, U_0 is attributed to polarization, I is the toroidal current and R is the major radius of the machine. The coefficient γ depends on para- or diamagnetism and on toroidal effects and exhibits a weak dependence on the minor radius.