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# On the evolution equations of field gradient tensor invariants in MHD Theory

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The understanding of the evolution of turbulence in space plasmas requires the investigation of magnetic field and plasma structures and their time evolution. Indeed, the interactions among different topological multi scale structures have been shown to play an important role tu understand the energy transfer across scales and dissipation. A possible approach to this issue is the study of the geometrical invariants of magnetic and velocity field gradient tensors from a Lagrangian point of view. In the early 1980 a series of works (Vielliefosse, 1982 and 1984) discussed a nonlinear homogeneous evolution equation for the velocity gradient tensor in fluid dynamics. Here, we derive the evolution equations of the geometrical invariants of the magnetic and velocity field gradient tensors in the case of magneto-hydrodynamic theory and discuss their application to the analysis of magneto-hydrodynamic turbulence in space plasmas.