



Transonic Magnetohydrodynamic Flows in laboratory and astrophysical plasmas

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The study of magnetohydrodynamic waves and instabilities of both laboratory and astrophysical plasmas has been conducted for many years starting from the assumption of static equilibrium. Recently, there is an outburst of interest for plasma states where this assumption is violated. In fusion research, this interest is due to the importance of neutral beam heating and pumped divertor action for the extraction of heat and exhaust considered for future tokamak reactors. Both result in rotation of the plasma with speeds that do not permit the assumption of static equilibrium anymore. In astrophysics, observations in the full range of electromagnetic radiation has revealed the primary importance of plasma flows in such diverse situations as coronal flux tubes, stellar winds, rotating accretion disks, and jets emitted from radio galaxies. Again, these flows have speeds which substantially influence the background stationary equilibrium state, if such a state exists at all. Consequently, it is important to study the stationary states of magnetized plasmas with flow.