

Seminar

Institute for Plasma Research

Title : Linear and nonlinear global gyrokinetic study of microinstabilities and development of tools for EM-GLOGYSTO

Speaker : Mr. Aditya Krishna Swamy
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Date : 14 September 2016 (Wednesday)

Time : 10.00 AM

Venue : Committee Room 4, (New Building), IPR

Abstract:

Turbulent transport of energy, particles and momentum is one of the important limiting factors for long time plasma confinement. Modern study using gyrokinetic formalism and simulation has progressed to identify several microinstabilities that cause ion and electron thermal transport. Typically, these have been ballooning parity modes such as Ion Temperature Gradient mode (ITG), Kinetic Ballooning Mode (KBM) and Electron Temperature Gradient mode (ETG) which cause transport through fluctuations or tearing parity modes such as Microtearing modes (MTM) which change the local magnetic topology and cause transport through stochastization of the magnetic field. Mean poloidal and toroidal flows have been found to have a profound effect on the confinement characteristics. Here, linear studies on the role of global safety factor profile variation on the MTM instability and global mode structure in large aspect ratio tokamaks will be discussed. At lower shear, linearly unstable Mixed Parity Modes are found to exist. Several characteristics and global mode structures of these modes as well as linear and nonlinear investigations to study the role of mean flows will be presented. Tools developed for these numerical investigations will be presented.
