

Seminar

Institute for Plasma Research

- Title :** Study of waves and instabilities in IMPED plasma
- Speaker :** Dr. Sayak Bose
Institute for Plasma Research, Gandhinagar
- Date :** 30 August, 2016 (Tuesday)
- Time :** 11.00 AM
- Venue :** Committee Room 3, (New Building), IPR

Abstract:

Inverse Mirror Plasma Experimental Device (IMPED)^[1] is a novel magnetized linear plasma device that has been developed in Institute for Plasma Research for controlled study of waves and instabilities with special emphasis on phase mixing and breaking of plasma oscillations. The unique control features of IMPED enables production of quiescent collisionless magnetized plasmas by reducing sources of free energy perpendicular to the magnetic field. Phase mixing of plasma oscillations is under investigation in the quiescent collisionless regime at pressures less than 10^{-4} mbar and ambient density fluctuation 0.1%. The plasma control features of IMPED are used to tailor the radial density and potential profile for simultaneous excitation of drift wave and Kelvin – Helmholtz instability. These instabilities are observed to interact nonlinearly with each other leading to the formation of side bands. Bispectral analysis has been used to experimentally confirm the nonlinear coupling. The side bands are usually asymmetric in nature. However, the extent of asymmetry, i.e. the ratio of the power of the left to the right side band is controlled experimentally, which occasionally leads to symmetric side bands. The method of excitation and control of these instabilities is presented.

References

1. Bose et al. Rev. Sci. Instrum. 86, 063501 (2015).
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