Seminar

Institute for Plasma Research

Title :	Synchronization Dynamics Between Two Coupled Glow Discharge Plasma sources
Speaker :	Neeraj Chaubey Institute for Plasma Research, Gandhinagar
Date :	4th July 2017 (Tuesday)
Time :	11:00 AM
Venue :	Seminar Hall, IPR

Abstract:

Synchronization among elements of an assembly of oscillators is a well-studied phenomenon and a useful paradigm for understanding collective behaviour observed in various natural and laboratory situations ranging from in-phase glowing of fireflies to understanding phase transitions in material media. A plasma is a highly complex system exhibiting various kinds of oscillations and instabilities that often give rise to turbulent or chaotic behaviour. The study of synchronization phenomena in such a system poses interesting experimental and theoretical challenges. In this talk I will describe experimental and numerical investigation of synchronization studies between two coupled glow discharge plasma sources. Numerical investigation has been carried out using two coupled Van der Pol equations and these results are found to be in good agreement with the experimental results. Some of the topics that will be covered in this talk are: (1) Frequency entrainment and frequency pulling states for two mutually coupled plasma sources (2) Phase-flip transition and associated hysteresis behaviour (3) Harmonic synchronization between two mutually coupled plasma sources.