

Seminar

Institute for Plasma Research

Title : Terahertz generation from a collective plasma dynamics in a thin semiconductor gap

Speaker: Dr. Deepa Verma
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Date : 31st January 2020 (Friday)

Time : 03:30 PM

Venue : Committee Room 3, (New Building), IPR

Abstract :

In this presentation, we theoretically investigate the source and nature of collective oscillations in a thin bounded plasma system using a one-dimensional particle-in-cell approach. Such an investigation is to understand the emission of electromagnetic radiation of terahertz (THz) order that is observed in semiconductor devices. Our study tells that the THz radiation taking place due to the collective excitation of the electrons [1]. The collective dynamics of the electrons are taking place at the plasma frequency and also generates its multiple higher harmonics. Further, this harmonics generation is found to depend upon the plasma parameters. Based on simulation results, we could show a qualitative match with the radiation obtained from the experimental setup of a semiconductor device [2].

References:

- (1) High-Energy, Short-Duration Bursts of Coherent Terahertz Radiation from an Embedded Plasma Dipole. *Scientific Reports* volume 8, 145 (2018).
 - (2) Electrical excitation of super-radiant intersubband plasmons. *APL*. 107, 241112 (2015).
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