

Seminar

Institute for Plasma Research

- Title:** Excitation of terahertz surface plasmons by lasers and electron beam
- Speaker:** Dr. Rohit Kumar Srivastav
Jaypee Institute of Information Technology (JIIT),
Noida
- Date:** 12th April 2024 (Friday)
- Time:** 03:30 PM
- Venue:** Board Room, IPR

Abstract

The excitation of terahertz (THz) surface plasmon waves (SPWs) by various processes, such as beating of lasers frequencies, second and third harmonic generation, linear mode conversion, and optical rectification over the magnetized rippled surface of n-InSb (or rippled graphene surface, which is deposited on SiO₂) using lasers and electron beam in the presence and absence of external magnetic field, is investigated. Rippled structure gives extra momentum or energy for the resonant excitation of THz SPWs, and enhances the amplitude and growth rate of THz SPWs. The magnetic field becomes an actively tunable parameter for the THz SPWs. It confines the electrons within the plasma region and maintains the cyclotron frequency. It also provided additional momentum to the electrons, resulting in a significant rise in the amplitude and growth rate of THz SPWs. The amplitude and growth of THz SPWs could be changed by the laser settings, the angle of incidence, an external magnetic field, the temperature, and doping. An external electric field on the surface of graphene might also be able to control them.
