

Seminar

Institute for Plasma Research

Title : Efficient second harmonic generation with 1D ZnO nanostructures and their application for realization of ultrafast laser diagnostic system

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Date : 11th June 2018 (Monday)

Time : 03.30 PM

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

Abstract :

Ultrafast lasers are the lasers that emit optical pulses of duration in the range of picosecond (10-12 s) to femtosecond (10-15 s). In industry and medical science, these lasers are extensively used for various applications like nonlinear optical (NLO) frequency conversion, high resolution microscopy, material processing, microsurgery, frequency metrology, THz generation, detection, imaging etc. For reproducibility and precise control of these applications; continuous, real time and accurate diagnostic or characterization of ultrafast pulses is highly essential. For this, at this moment highly expensive NLO crystals are used in commercial systems. These crystals also suffer from other limitations like wavelength specificity, low damage threshold, hygroscopicity, etc. To overcome these limitations, thin films containing highly dense one dimensional ZnO nanostructures (ZnO Nanorods) have been grown by low temperature and cost-effective chemical bath deposition method. The second harmonic generation (SHG) is a NLO process which is commonly used in development of ultrafast laser pulse diagnostic systems. So, in this work this process has been studied. These nanostructures have also been used to realize a SHG Fringe Resolved Autocorrelator system for ultrafast laser pulse characterization. Studies are also conducted on SHG behavior of ZnO nanofibers.
