

Seminar

Ultrafast Dynamics in Intense Femtosecond Laser-Matter Interactions

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One major aspect in the interaction of ultrashort laser pulses with matter is optimal control of ultrafast electron dynamics with light fields. Such control holds the promise of many scientific and practical applications. This presentation will discuss experimental studies on capturing rapid plasma dynamics and controlling ultrafast photocurrents. In the first part of the talk, I will discuss about measuring high-intensity laser-induced ultrafast plasma evolution by employing different pump-probe based diagnostics.^[1] Following this, I will talk about the generation and control of ultrafast currents with the aim of exciting very short, intense magnetic field pulses.^[2] Driving coherent control with spatially structured light pulses we generate transient current structures that serve as sources of magnetic impulses, structured terahertz radiations and optoelectronic circuits.

References:

1. K. Jana *et al.*, *Phys. Rev. Research* 3, 033034(2021), K. Jana *et al.*, *Appl. Phys. Lett.* 114, 254103 (2019); K. Jana *et al.*, *Phys. Plasmas* 25, 013102 (2018), K. Jana *et al.*, *AIP Advances* 12, 095112 (2022)
2. K. Jana *et al.*, *Nat. Photonics* 15, 622 (2021), K. Jana *et al.*, *Nanophotonics* 11, 787 (2022); K. Jana *et al.*, *arXiv:2310.06262* (2023) (Revised manuscript submitted to *Science Advances*)

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4:00 PM (Tea / Coffee 3:45 PM)

Auditorium, TIFR-H