

Seminar

Exploring Photonic Spin Hall Effect for Materials' Studies

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Light-assisted non-invasive characterisation tools offer the possibility of analysing/diagnosing materials at the device level. In such techniques, the Photonic Spin Hall Effect (PSHE) is emerging as a promising technique for sensitive probing of materials by analysing spin separations created in light beams while interacting with a dielectric medium. Our research explores the applications of PSHE for material characterisation, particularly towards ultra-thin film characterisation by addressing challenges in experimental implementation in reflection geometry. A novel retro-reflected PSHE technique is also developed along with conventional incident angle (30 degree-80 degree) based PSHE. The optical measurements are integrated into a closed-cycle cryostat, facilitating simultaneous measurements of electronic, magnetic, and optical properties. Theoretical frameworks are established to interpret PSHE data accurately, exploring the detection of magnetic and optical properties in various materials, including thin films and 2D atomic layers. Moreover, the study lays the groundwork for utilising PSHE to investigate valley-engineered materials, providing insights into their unique properties.

Wednesday, Mar 27th 2024

11:30 Hrs (Tea / Coffee 11:15 Hrs)

Auditorium, TIFR-H