



RAJARATHINAVEL P

5th Year Undergraduate, Department of Physics

Email: rajarathinavelp@iitkgp.ac.in

Mobile: +91 6381278257

EDUCATION

Year	Degree/Exam	Institute	CGPA/Marks
2023	Integrated MSc (5Yr) - Physics	IIT Kharagpur	7.89/10 (9 th sem)
2018	All India Senior School Certificate Examination	Amrita Vidyalayam	458/500(91.6%)
2016	All India Secondary School Examination	Amrita Vidyalayam	10/10

RESEARCH PROJECTS & INTERSHIPS

Master's Thesis

Prof Prasanta Kumar Datta
(Aug' 2023-Present)

- Obtained various material parameters like **refractive index and absorption coefficient** using the **Fresnel reflection and transmission coefficients** on the samples of **quartz and L-phenylalanine**.
- Determined the phase and amplitude of the transmitted wave through each sample simultaneously and separately.
- Traced the whole THz cycle by moving the delay stage using an automated code written in the LabVIEW environment.

Observations and results from the quartz sample:

- Obtained refractive index (real and imaginary) and Absorption coefficient.
- Using the data obtained, the frequencies at which peak positions (the fingerprints for a quartz sample) were found to **match** the literature values.

Observations and results from L-phenylalanine:

- Obtained separately the THz field strength versus the angle of generating ZnTe and detecting ZnTe.
- Obtained the variation of THz field strength versus the pump power.
- Obtained the material's Absorption coefficient and refractive index (real and imaginary).
- **Optimized** the THz field strength using the **generating and detecting ZnTe crystals**.

Summer Internship

Prof Prasanta Kumar Datta
(May-June 2022)

- Assembled Michelson Interferometer setup.
- Measured the coherence length of the He-Ne and Nd: YVO4 laser.
- Assembled Fabry Perot etalon.
- Assembled the lasing cavity of the Nd: YVO4 laser.

SKILLS AND EXPERTISE

- Handling optics and alignment.
- Operating THz-TDS (Time Domain Spectroscopy) Setup.
- Programming Languages: Python | C | C++ | HTML.
- Software Tools / Packages: SolidWorks | MATLAB | NumPy | Pandas | Matplotlib | MS Office | Git | Latex.

RELEVANT COURSE WORK

- **Physics-** *Electronics, Quantum Mechanics, Physics of Photonics Devices, Non-linear Optics, Optical Fiber Technology, Photonic Quantum Information Technologies, Optics, Experimental Methods,* Atomic and Molecular Physics, Physics I and II, Classical Mechanics, Electrodynamics, Fluid Mechanics and Elasticity, Thermal Physics, Condensed Matter Physics, Nuclear, and Particle Physics, Statistical Physics, Order and Chaos, Pattern Forming Instabilities and Turbulence, Crystal Physics.
- **Mathematics-** Mathematics I: Linear Algebra, ODEs, special function, Complex analysis; Mathematical Methods II: Group Theory, PDEs; Transform Calculus.
- **Computing-** Programming and Data Structures (Lab and Theory), Design and Analysis of Algorithms, Computational methods theory, Computational Physics Lab.

EXTRA CURRICULAR ACTIVITIES

Sports

- Got the position of Sports Captain in my school for the academic year 2016-17.
- Member of NSO (National Sports Organization) Health and Fitness of IIT Kharagpur.
- Took part in Inter Hall Hockey competition from LBS Hall of Residence.

Cultural

- Participated in various dramas, music, and dance festivals on Vedic themes.
- Given seminars on "The Art of Self-Management" as a part of activities in the Personality Development Forum, a society at IIT Kharagpur.