

I-STEM Software Request - Guide Approval Form

User Details

- **Name of Researcher:** Dr. Kavil Mehta
- **User Type:** ☐ Ph.D. Scholar ☒ Postdoctoral Researcher ☐ Bachelor's ☐ Masters
- **Institution Name** : Physical Research Laboratory
- **Institutional Contact No:** 07926314559
- **Research Topic:** Intense laser-matter interactions, laser-driven ion acceleration, laser-plasma X-ray sources

Software Request Details

- **Software Name:** COMSOL Multiphysics
- **Justification for Software Request:** [Provide detailed explanation of how the software supports your research objectives]

We request access to **COMSOL Multiphysics** to support our ongoing research on **laser-driven ion acceleration and charged particle diagnostics** at the **Physical Research Laboratory (PRL), Ahmedabad**.

Our research involves the design, optimization, and validation of **Thomson Parabola Spectrometer (TPS)** for the characterization of ions generated during ultra-intense laser-plasma interactions. COMSOL Multiphysics will be used to perform detailed finite element simulations of the electric and magnetic fields within the spectrometer, evaluate field uniformity, minimize aberrations, and optimize the geometry for improved energy and species resolution. The simulation results will be directly compared with experimental data obtained from high-power laser campaigns conducted at national laser facilities such as Petawatt laser facility at RRCAT, Indore.

In addition to TPS design, the software will be employed to model electrostatic and electromagnetic components used in charged particle diagnostics and to support the development of new experimental configurations for laser-plasma interaction studies. The multiphysics capabilities of COMSOL are essential for accurately simulating coupled electromagnetic phenomena that cannot be adequately addressed using analytical calculations alone.

Access to COMSOL through i-STEM will significantly enhance the quality and reliability of our research, reduce the need for repeated experimental iterations, and contribute to the development of advanced diagnostic instrumentation for high-energy-density physics and laser-plasma research in India.

Guide/Supervisor Approval

I, Dr. Prashant Kumar (Guide/Supervisor Name),

- Confirm that the above-mentioned researcher is affiliated with our institution
- Have reviewed the software request and its relevance to the researcher's academic work
- Approve the software request for research purposes

Approval Confirmation

- I approve the software request
- The software aligns with the researcher's research objectives
- The request meets the institutional research guidelines

Guide/Supervisor Signature: Prashant Kumar 21/7/26

Date: 21/7/26

Official Stamp/Seal: [Space for Institutional Stamp]

Important Notes

1. This form must be signed and scanned
2. The scanned copy must be uploaded with the software request
3. Electronic signatures are acceptable if from an official institutional email

