

I-STEM Software Request - Guide Approval Form

User Details

- Name of Researcher: _____ Rudraneel Baidya _____
- User Type: ☐ Ph.D. Scholar ☐ Postdoctoral Researcher ☒ Bachelor's ☐ Masters
- Institution Name : _____ NIT Silchar _____
- Institutional Contact No: _____ 03842 242 273 _____
- Research Topic: _____ Electric field modulated sorting: Study and analysis of droplet deformation _____

Software Request Details

- Software Name: _____ COMSOL _____
- Justification for Software Request: COMSOL Multiphysics is a powerful finite element analysis (FEA) software that is particularly well-suited for studying and analysing the deformation of **leaky dielectric fluids**, especially under the influence of electric fields. These fluids exhibit electrohydrodynamic behavior driven by electric forces acting on mobile charges, which in turn deform the fluid interface. COMSOL can model the coupled physics involved—electrostatics, fluid dynamics, charge transport, and interface motion—accurately and simultaneously. It supports the leaky dielectric model, enables interface tracking through phase field or level set methods, and calculates the resulting forces using the Maxwell stress tensor. With customizable materials, geometries, and time-dependent analysis, COMSOL provides a comprehensive and precise environment to study the dynamic deformation of such fluids under electric fields.

Guide/Supervisor Approval

I, _____ Dr. Somnath Santra _____ (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: Somnath Santra

Date: 22-05-2025

Official Stamp/Seal: [Space for Institutional Stamp]

Important Notes

