PMRF-ISSS Teaching Programme

Prime Minister Research Fellowship students' teaching requirement facilitated by the Institute of Smart Structures and Systems

Module PMRF-ISSS113/2024

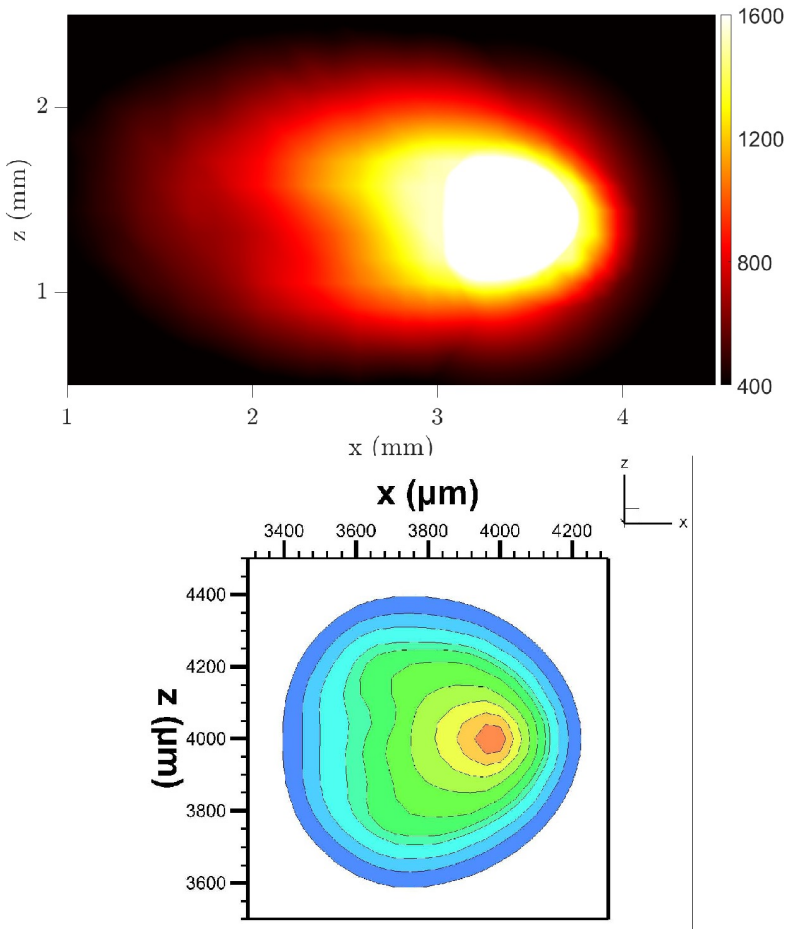
Modelling of Transport Phenomena in Laser melting based Additive Manufacturing

Name of the PMRF student

Abhik Deb

Required background of the students taught

Mechanical Engineering



Details of the content of the module

This module will provide a basic training for modelling of heat transfer and fluid flow involved in laser melting based Additive Manufacturing process. It comprises of about 20 hours of lecturing, and covers the following:

1. Solution of Conservation equations: mass, momentum and energy.
2. Basics of Laser based metal Additive manufacturing: Powder bed Fusion and Direct Energy Deposition techniques
3. Modelling of Solidification using single domain approach.
4. Solution of transport phenomena: conservation equations involved in solidification using ANSYS Fluent tool.
5. Solving melting and solidification problem from heated walls.
6. Modelling of Laser based direct energy deposition process with the added powder being : (i) same material as substrate, and (ii) different material from substrate.

Availibility of ANSYS tool will be beneficial towards first hand learning experience

Schedule of the module

Tentative Schedule:

Start date: 15th August, 2024

End date: 30th August, 2024

2 hours lecture :6-8 p.m., (either recorded or live) every Monday, Tuesday, Thursday, Friday.

Meeting link :

meet.google.com/wgn-evea-epy

Contact email ID: isss.forum@gmail.com /

abhikdeb@iisc.ac.in

Registration link: Click Here

https://forms.gle/mwPHpWqvd8FBtRBV7