PMRF-ISSS Teaching Programme

Prime Minister Research Fellowship students' teaching requirement

facilitated by the Institute of Smart Structures and Systems

Module PMRF-ISSS117/2024

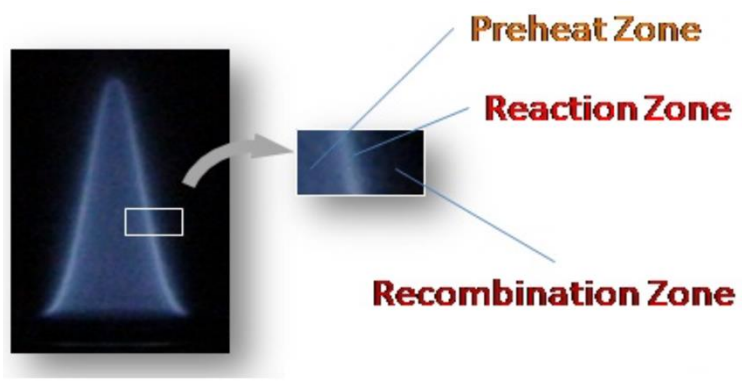
Combustion: Fundamentals & applications using Cantera

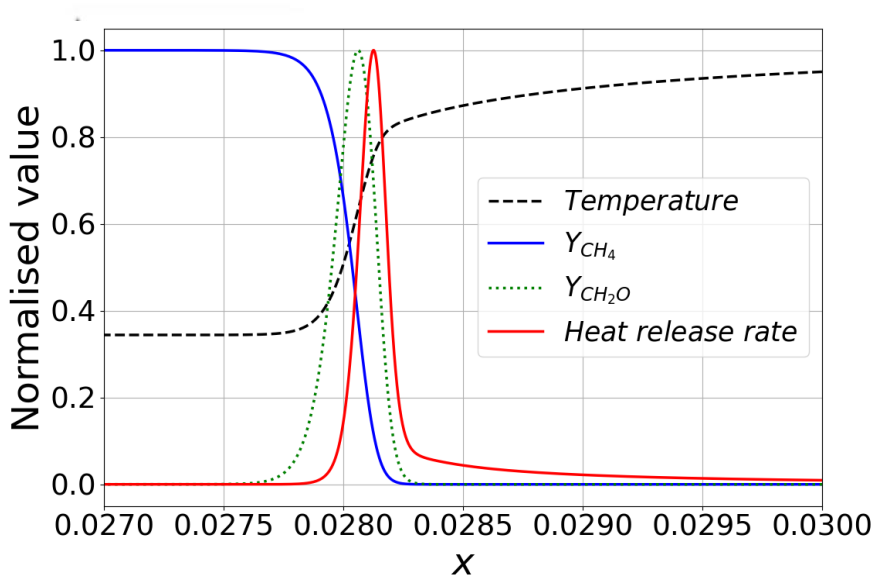
Name of the PMRF student

Anindya Datta

Required background of the students taught

Aerospace, mechanical, chemical engineering and related disciplines. Basic knowledge of thermodynamics and fluid dynamics is desired.





Details of the content of the module

This module will introduce the basic principles of combustion science including

1. **Chemical thermodynamics:** Adiabatic flame temperature, chemical equilibrium
2. **Chemical Kinetics**: Global and elementary reactions, reaction rates, multistep mechanisms
3. **Conservation equations for reacting flows:** Well stirred and plug flow reactors
4. **Laminar premixed flames**: Flame speed, flame structure, flame length scales
5. **Laminar non-premixed flames:** Mixture fraction, counterflow and jet flames.

The topics will be discussed in integration with examples/problems solved using **the open-source software Cantera**.

Schedule of the module

Start Date: September 02, 2024

End Date: September 30, 2024

Class schedule: Monday, Tuesday and Friday

Class time: 06:30 – 08:00 pm

Total duration: 19.5 hours

Meeting link : https://tinyurl.com/2p346jpv

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

anindyadatta@iisc.ac.in

Registration link: https://forms.gle/M4UjyESQcFJFv7k79