
AE 351 A- Experiments in Aerospace Engineering – III (Propulsion)

Instructor:

Dr. Vaibhav Arghode

Office: Propulsion Lab

Phone: 6294

E-mail: varghode@iitk.ac.in

Friday

2 PM – 5 PM

List of experiments

1. Experimental investigations on premixed lpg-air flame
2. Calibration of supersonic wind tunnel
3. Study and calibration of pressure sensor and flow meter
4. High-speed flow visualization using shadowgraph and schlieren technique

Exp. 1: Experimental investigations on premixed lpg-air flame

Measurements:

Temperatures at various locations in the flame, air and fuel flow rates, flame photograph, etc...

Performance parameters:

Temperature contour, equivalence ratio, burning velocity, etc...



Exp. 2: Calibration of supersonic wind tunnel

Measurements:

Wall static pressure distribution,
Pressure in settling tank, nozzle
geometrical parameters, etc...

Performance parameters:

Mach number based on local static
pressure and local area ratio



Exp 3. Study and calibration of pressure sensor and flow meter

Measurements:

Pressure at inlet and outlet of flow meters, velocity profile at the duct exit, pressure measurement using manometer and electronic pressure sensor etc...

Performance parameters:

Calibration of electronic pressure sensor, coefficient of discharge for the different flow meters, etc...



Exp. 4: High-speed flow visualization using shadowgraph and schlieren technique

Measurements:

Flow visualization over blunt body using schlieren and shadowgraph techniques

Performance parameters:

Shock structure in front of the blunt body



Lab report submission and Quiz:

- Rawdata for the respective experiment will be uploaded in the “Assignments” section at www.hello.iitk.ac.in
- You need to submit the lab report (**single pdf file**) before 2 PM on the subsequent Friday for the respective experiment (**see the schedule**)
- Quiz (30 minutes) will be taken at www.hello.iitk.ac.in at 3 PM on the subsequent Friday for the respective experiment (see the schedule)

Teaching Assistants

1. Experimental investigations on premixed lpg-air flame → **Mr. Ashlesh Dahake** (ashlesh@iitk.ac.in)
 2. Calibration of supersonic wind tunnel → **Mr. Sudama Bhati** (bhati@iitk.ac.in)
 3. Study and calibration of pressure sensor and flow meter → **Mr. Saurav Kumar** (ksaurav@iitk.ac.in)
 4. High-speed flow visualization using shadowgraph and schlieren technique → **Mr. Yash Jaiswal** (yashjai@iitk.ac.in)
- TAs will explain the theory and procedure for the respective experiments (videos uploaded at www.hello.iitk.ac.in) and grade the lab reports
 - You can contact the respective TAs for any clarification and discussion

Schedule

www.hello.iitk.ac.in

Lab #	Video, Handout and Rawdata Upload	Report Submission	Quiz
	Time: before 2 PM	Time: before 2 PM	Time: 3:00-3:30 PM
1	26/3	2/4	2/4
2	2/4	9/4	9/4
3	9/4	16/4	16/4
4	16/4	23/4	23/4

Discussion Hour

Join Zoom Meeting

<https://zoom.us/j/93049916266?pwd=M2hkZXk0d2gwOWlIOVlYdHVHWVhJQT09>

Meeting ID: 930 4991 6266

Passcode: 802154

#	Time: 2 PM
1	26/3
2	2/4
3	9/4
4	16/4
5	23/4

THANKS