

# MidTerm Report SURGE 2022 Research Project Title- SOAP FILM TUNNEL

**Name: Vikas Varshney**

**Project Mentor: Prof. Sachin Y. Shinde**

**Department: Civil Engineering**



## MID TERM EVALUATION

**AIM :** Flow past a square cylinder in a flowing soap film.

### **REQUIREMENTS FOR EXPERIMENTAL SETUP :**

A Monochromatic light source ( low pressure SOX lamp )  
Soap Solution filled Reservoir  
Guide wire (0.7 mm diameter)  
Pulling wire (0.4mm diameter)  
Rotameter (to measure volumetric flow of soap solution)

### **WORK PROGRESS :**

As we know, our first aim is to establish a setup for doing experiments. So, I was given to read some research papers. After reading papers, I came to know about **how to generate the liquid(soap) film?** , **how to visualise the fringes in soap film?** , **how to find the thickness of the film?** and **how to find Reynolds' number of the flow?** ,etc. I went through some research papers given in references and helped to finish the setup.

Now, the setup is completed and I have started doing the experiments. I have visualised fringes in a flowing liquid(soap) film through light interference effects. These effects can be produced by small variations using flow disturbing objects such as cylinders, wedges or air bubbles but I have used a pen to visualise fringes and vortex shedding. I have also fixed the position of a high FPS camera.

### **KEYWORDS :**

1. **2-D Visualisation Technique** to examine the flow patterns of soap solution around a test object.
2. **Monochromatic light source (low pressure SOX lamp)** is used to detect the vortices formed by the flow of soap solution when a flow disturbing object(test piece) is placed in its path. This lamp works by creating an electric arc through vapourized sodium metal.
3. **Velocity Measurement** can be done by judging the position of the vortex in the wake region as measured by a high FPS camera.

### **IMAGES TAKEN FROM THE LAB :**





#### REFERENCES :

1. <https://link.springer.com/content/pdf/10.1007/s003480050094.pdf>
2. <https://aip.scitation.org/doi/10.1063/1.1149232>
3. <https://link.springer.com/article/10.1007/BF03181514>
4. <https://doi.org/10.1063/1.1366634>
5. <https://doi.org/10.1119/1.3596431>