



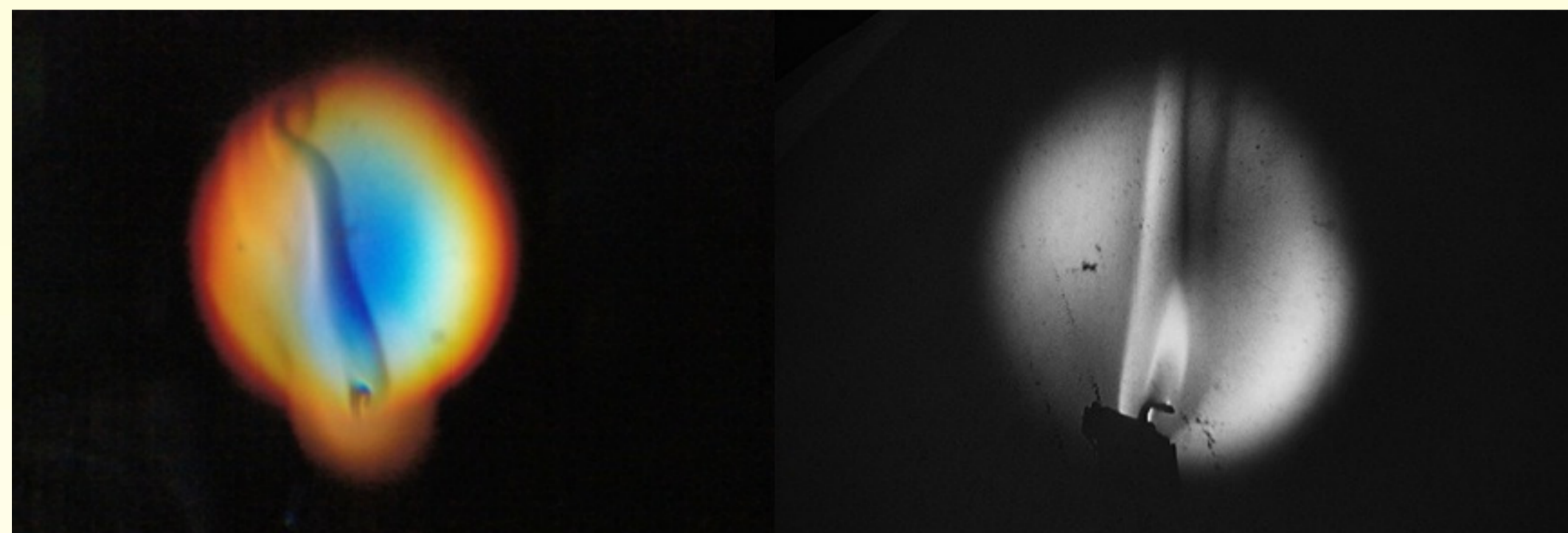
## Schlieren Photography Technique

Researchers: Lo Pokkan, Li Wunyi

Advisor: Prof. S.S. Shy

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### Introduction



Schlieren photography technique is an optical system for observe airflow and flame. Schlieren system prevalently applied for wind tunnel testing and industrial areas, it can make the airflow visualization for develop different research. It is a non-contact and non-destructive technique. Thus, all tests are in safe range and it won't destroy the test section by using schlieren system.

### Experimental

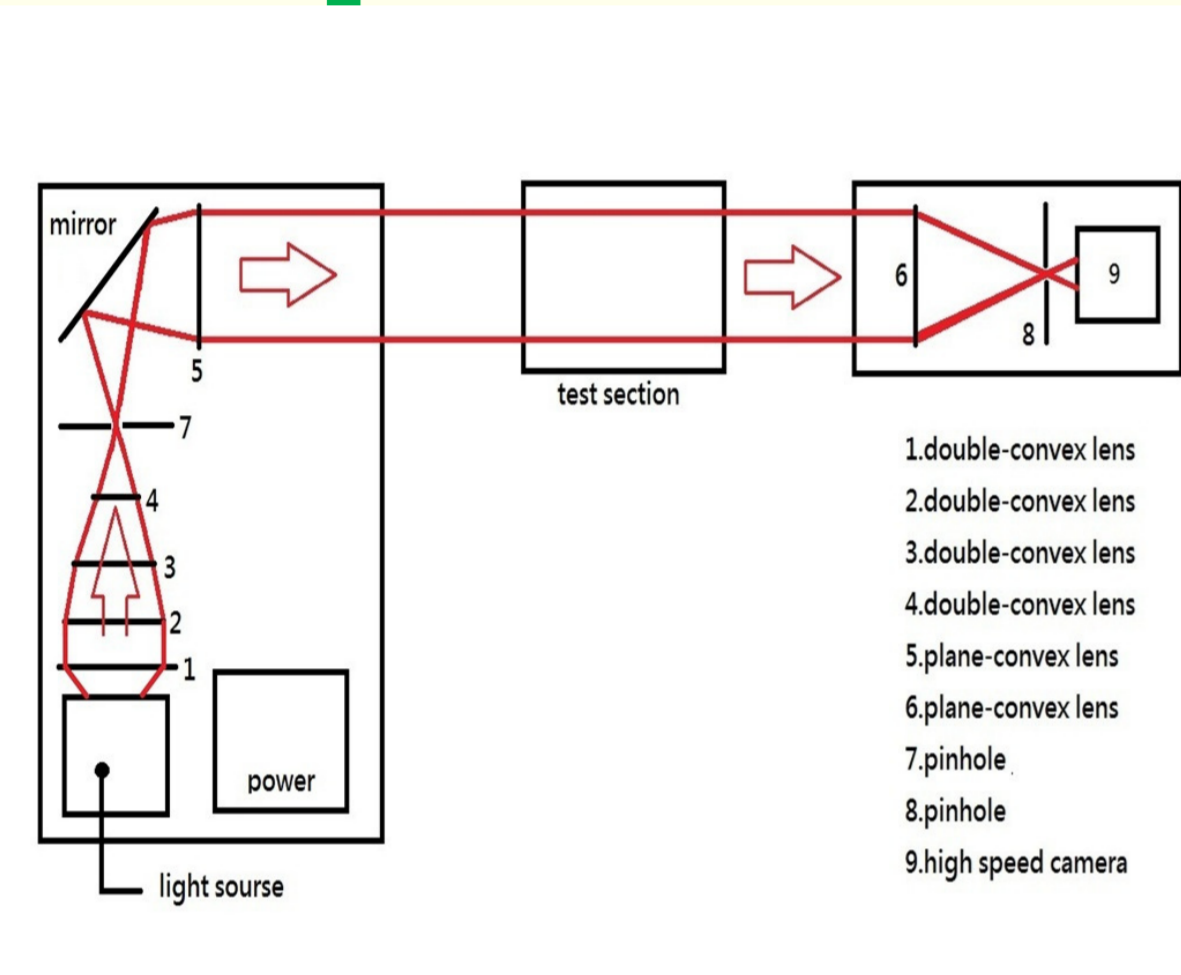


Fig. 1

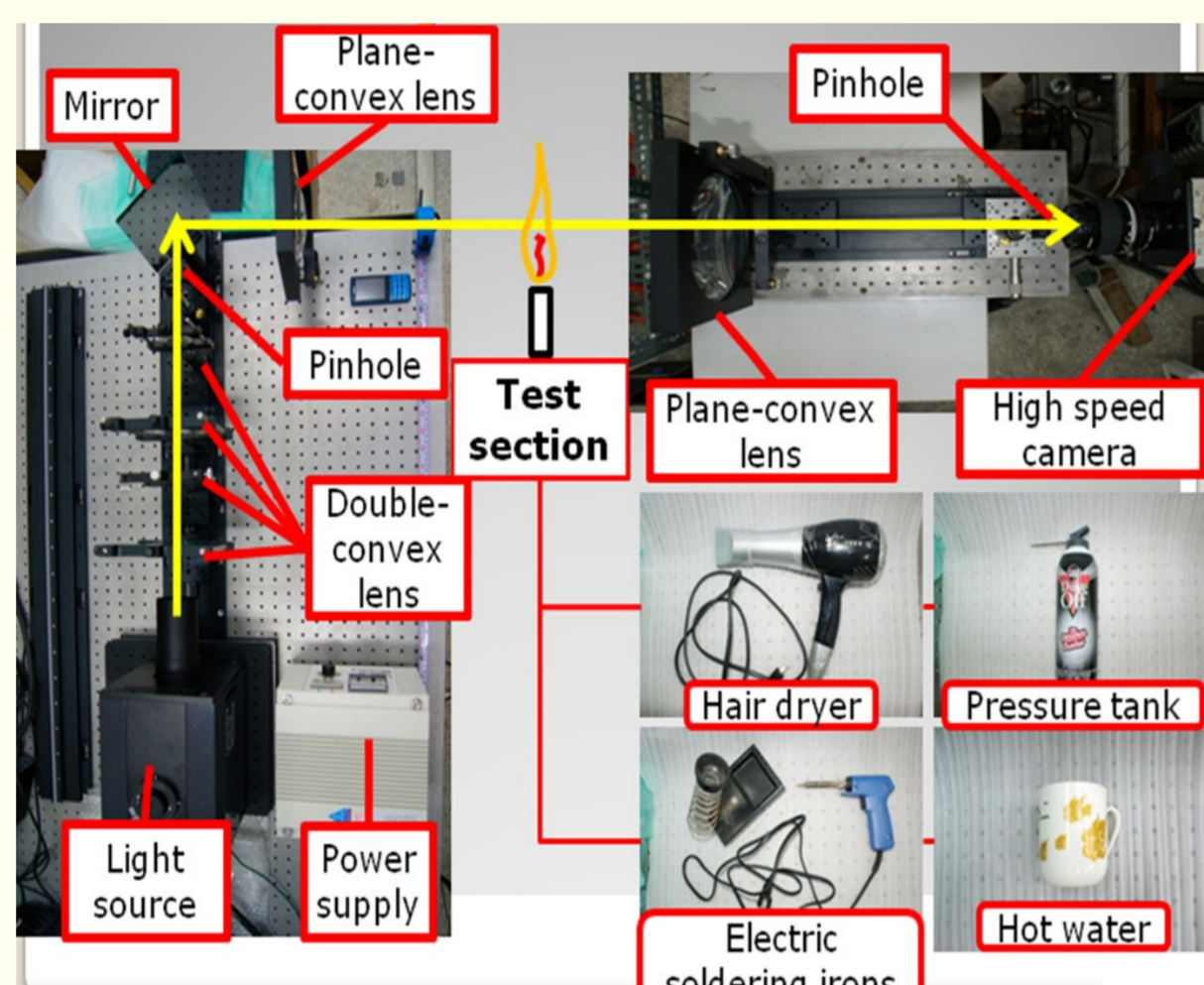


Fig. 2

Design then create a schlieren system in 90 X 60 cm<sup>2</sup> area for making a parallel light first. And then set up the other part schlieren system to catch the schlieren photo with using high speed camera.

Then set the different test section in the test area in order. The parallel light will pass though the test section and get into the CCD which in the high speed camera.

### Result

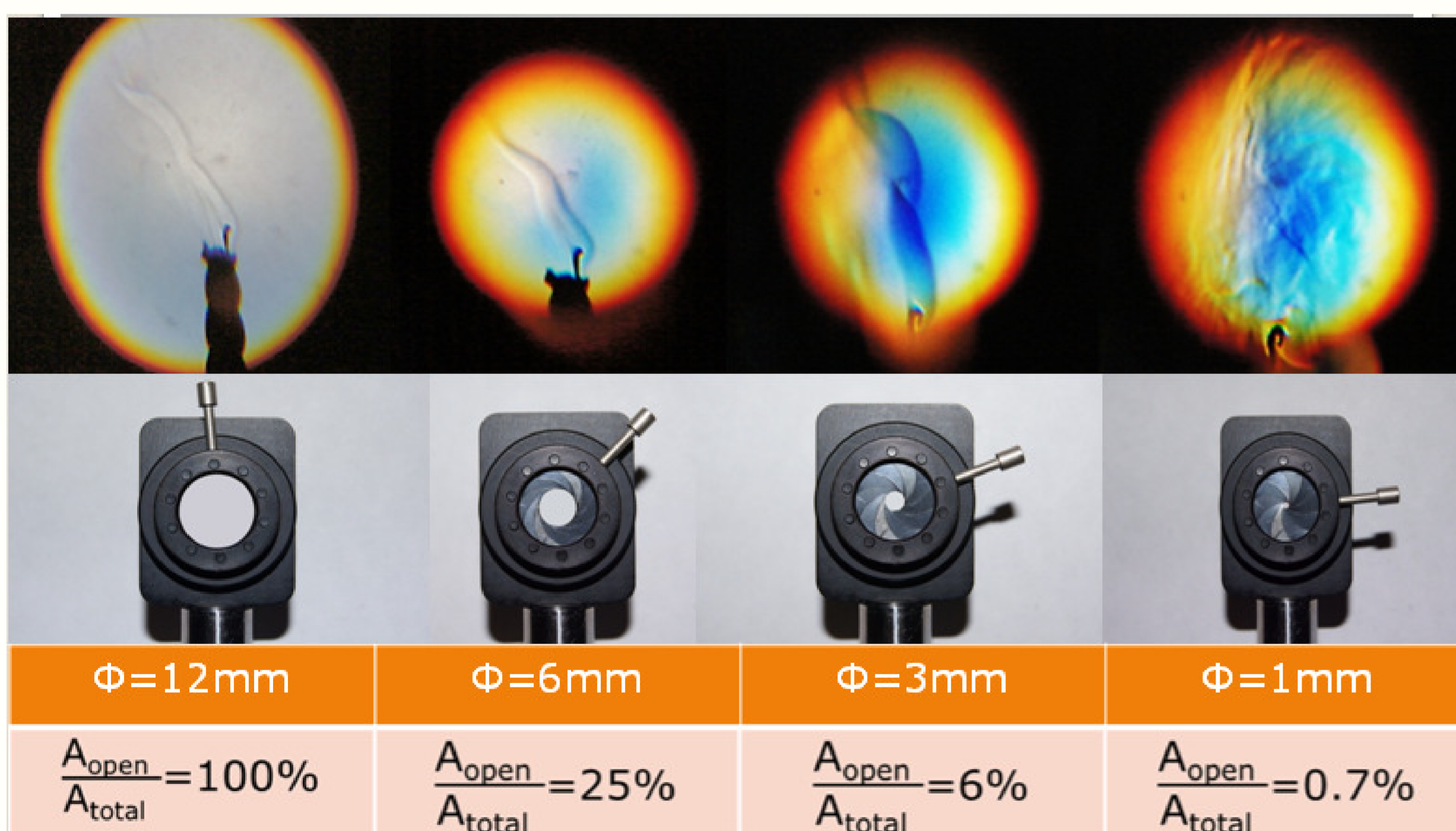


Fig. 3

Aperture is an important role in schlieren system. Aperture can affect the image going bright or dark. The best blocking rate will appear when the aperture diameter equal 3mm.

Fig. 4, we are interesting in four testing objects. By high speed camera, the airflow can be figured out easily in schlieren photography. From left to right, top to bottom are hair dryer, electric soldering gun, hot water and pressure tank.

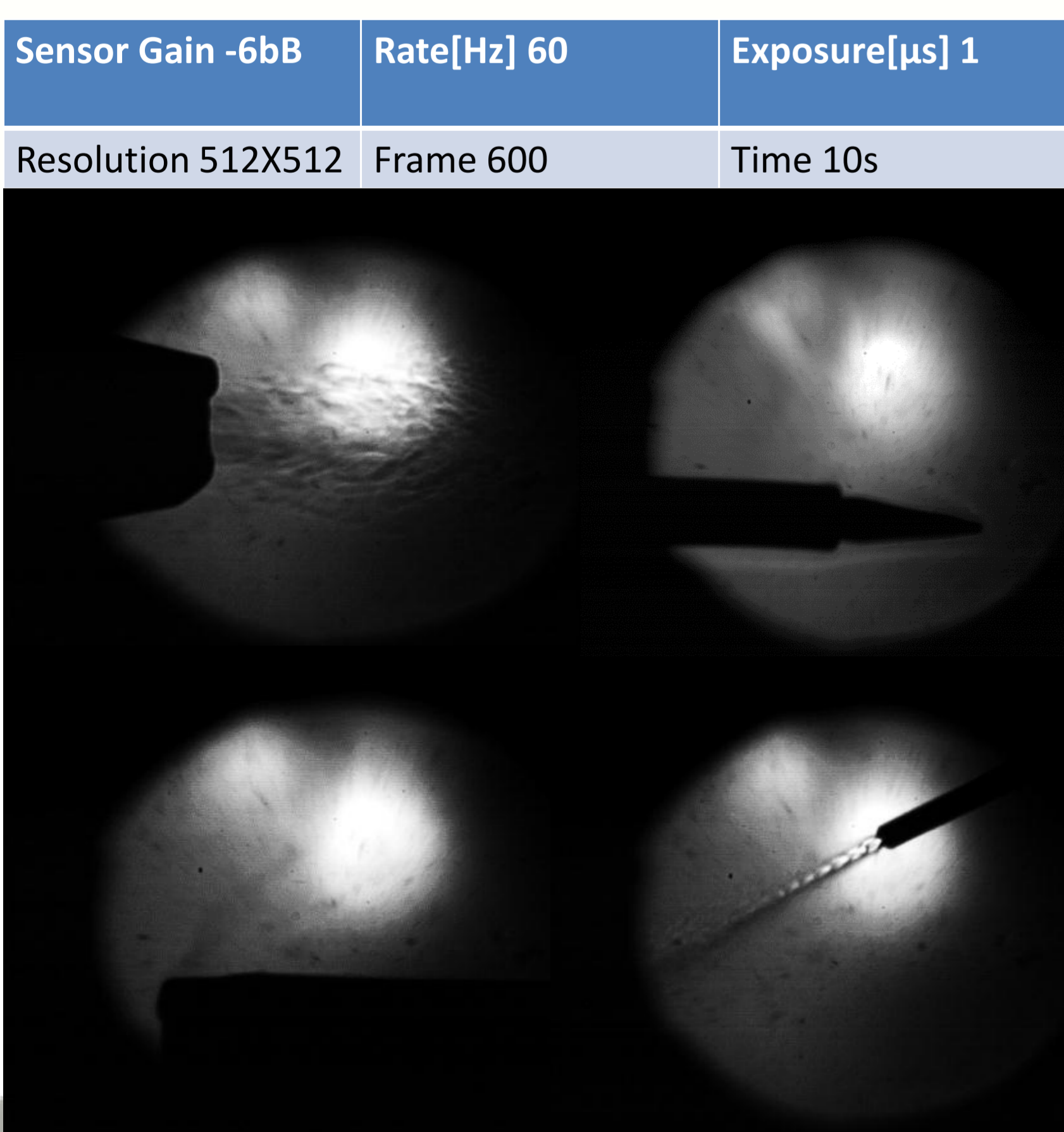


Fig. 4

### Conclusion

- Schlieren photography is a non-contact method to observe airflow. And we success to build this system by ourselves in this semester.
- The aperture size decides the clarity of image, In our re-search, the best diameter size is 3mm.

### Future Work

- To observe an expending spherical flame in pres-sure tank.
- Optimization
- Using gradient of gray color to calculate the temperature, pressure, and speed of airflow.

