

## **World Center of Education and Research for Trans-disciplinary Flow Dynamics**

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**Research: Global Skin Friction and Pressure Sensitive Paint Measurements in Complex Separated Flows**

**Supervisor: Professor Keisuke Asai**

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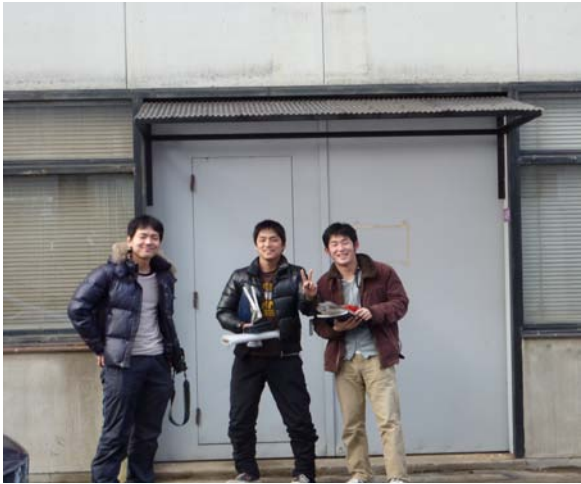
I would like to start off by saying that I never thought I would visit and experience Japan under the present circumstances. The Asai Laboratory at Tohoku University and the Applied Aerodynamics Group at Western Michigan University have been working together the past two years on global skin friction measurements using the technique developed by Dr. Tianshu Liu at Western Michigan University called the Global Luminescent Oil Film Skin Friction Meter (GLOFSFM).

The work over the past two years has been instrumental in developing GLOFSFM to the state it is at today, however there have been certain issues present in obtaining consistent results. In my work these past six weeks under the GCOE internship program, we have identified, understood and resolved a number of issues related to global skin friction measurements. One of the major achievements is the completion of a new and more robust processing code which has enabled a more straightforward and streamlined use of the code. A number of processing parameters were also studied in detail and the effects to the final results were analyzed. These studies performed over the last six weeks have been instrumental in understanding and explaining issues experienced in the past.

One of the main objectives of this internship was to measure skin friction and pressure fields in junction flows. Successful experiments were carried out in measuring both skin friction and pressure fields for square and diamond shaped cylinders in junction flow. We plan on writing a joint paper to be submitted to an international journal within the next few months. The next step will be combining the results obtained from skin friction and pressure field measurements to reconstruct near wall velocity fields. This work will be carried out over the next few months and if it is successful, will be a major contribution to the field of experimental fluid mechanics.

In summary, I believe this opportunity has been very beneficial to me in terms of personal as well as professional development. I am extremely impressed by the hardworking, intellectual and respectful nature of the Japanese people. I was also touched by hospitality, kindness and humility

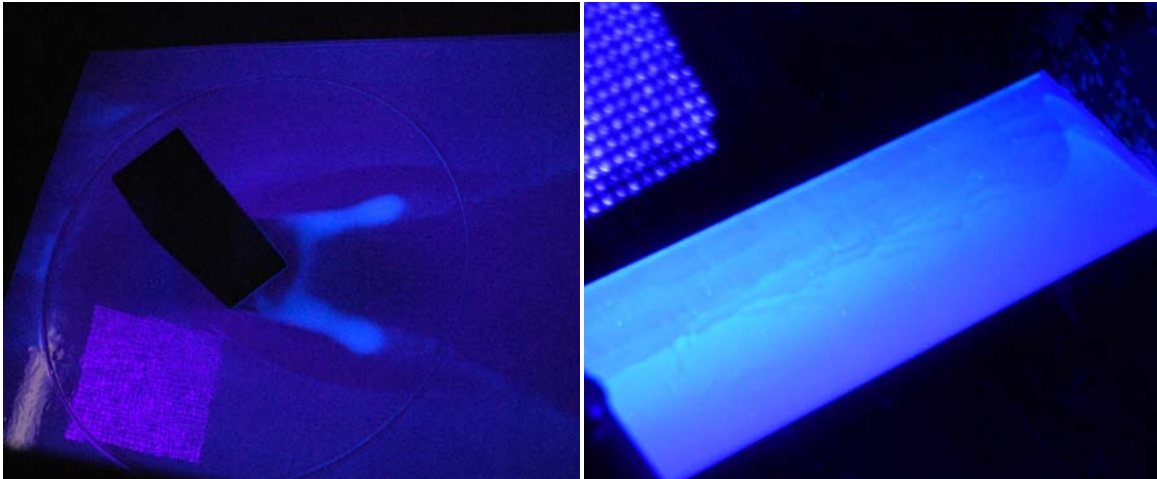
exhibited by everybody I have met along this trip. I can say that I have experienced Japanese culture and lifestyle the best way possible by means of the internship opportunity presented by GCOE. I would like to end by thanking Professor Keisuke Asai and his laboratory members for inviting me and giving me the opportunity to work alongside them and also to the Global COE program thank you for making it possible for me to have this wonderful experience.



**Asai Laboratory Members**



**Setting Up an Experiment**



**Experiments at Tohoku University's T-BART Wind Tunnel**