

Flow Visualization in the OSU

Presented to: **IAMFTFM**

By: **Tina Emami**

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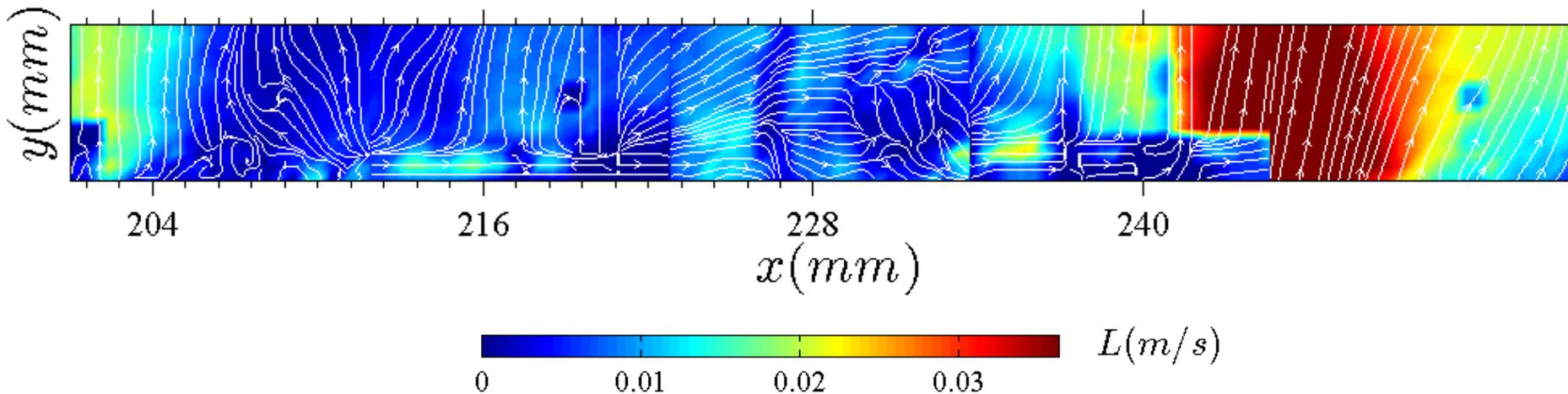
Airflow Project Goals

Create an adjustment to the current OSU apparatus in order to create an even and reproducible air flow.



Background

- Moved the location of the air inlet from the side of the OSU to the bottom to test imbalance in flow
 - This created air circulation through the center of the OSU near the test sample, but created a more even upwards flow on both sides of the OSU



Background cont.

- **Want to observe the airflow leaving the OSU chimney, but with the current configuration we will need to complete measurement near the test sample first**
- **Unable to perform CFD at the FAA TC**
- **Still looking for uniform flow towards the sample holder**

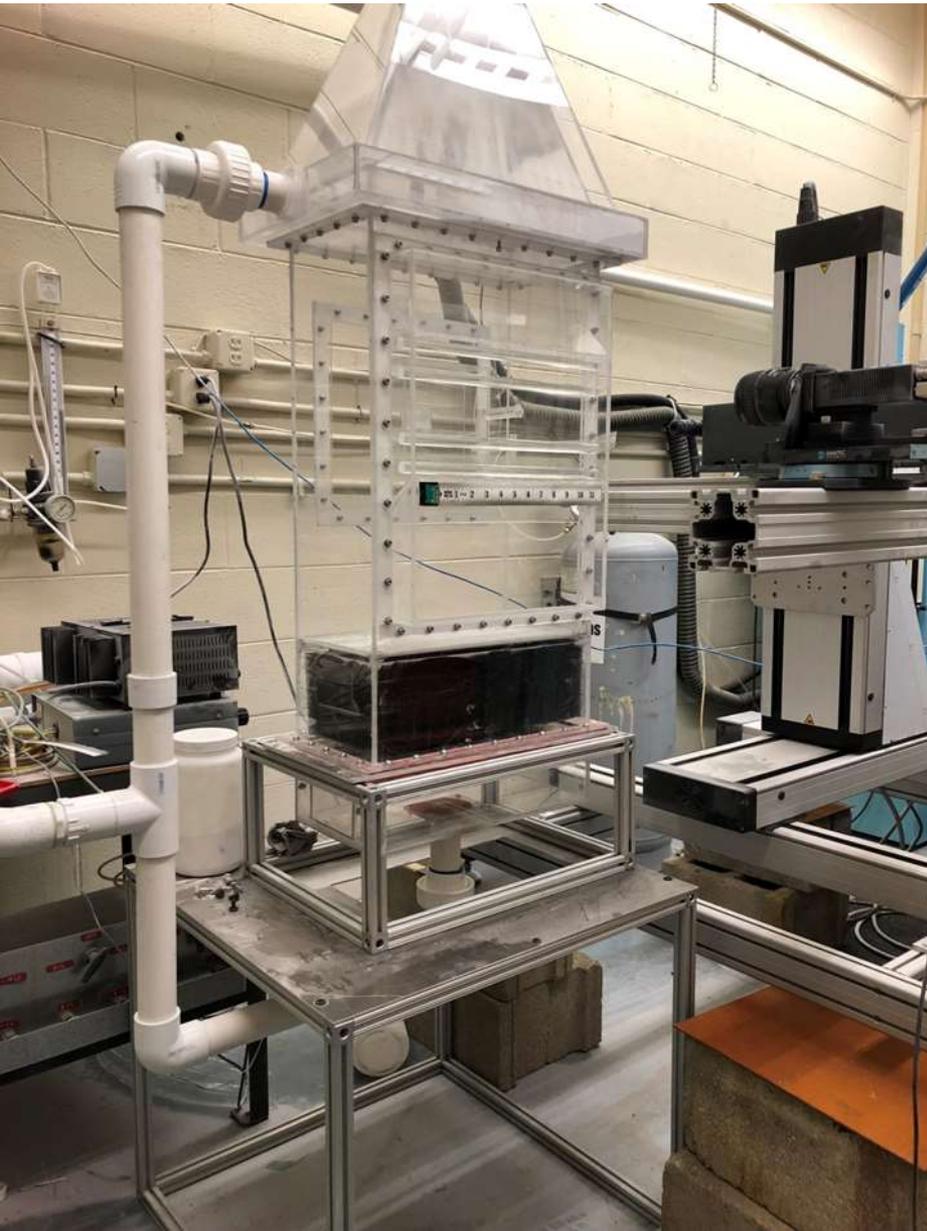


New Test Setup

- **Reticulated foam was placed inside the second chamber of the OSU**
- **Since it is extremely porous, starting with this will give me a direction to move towards**

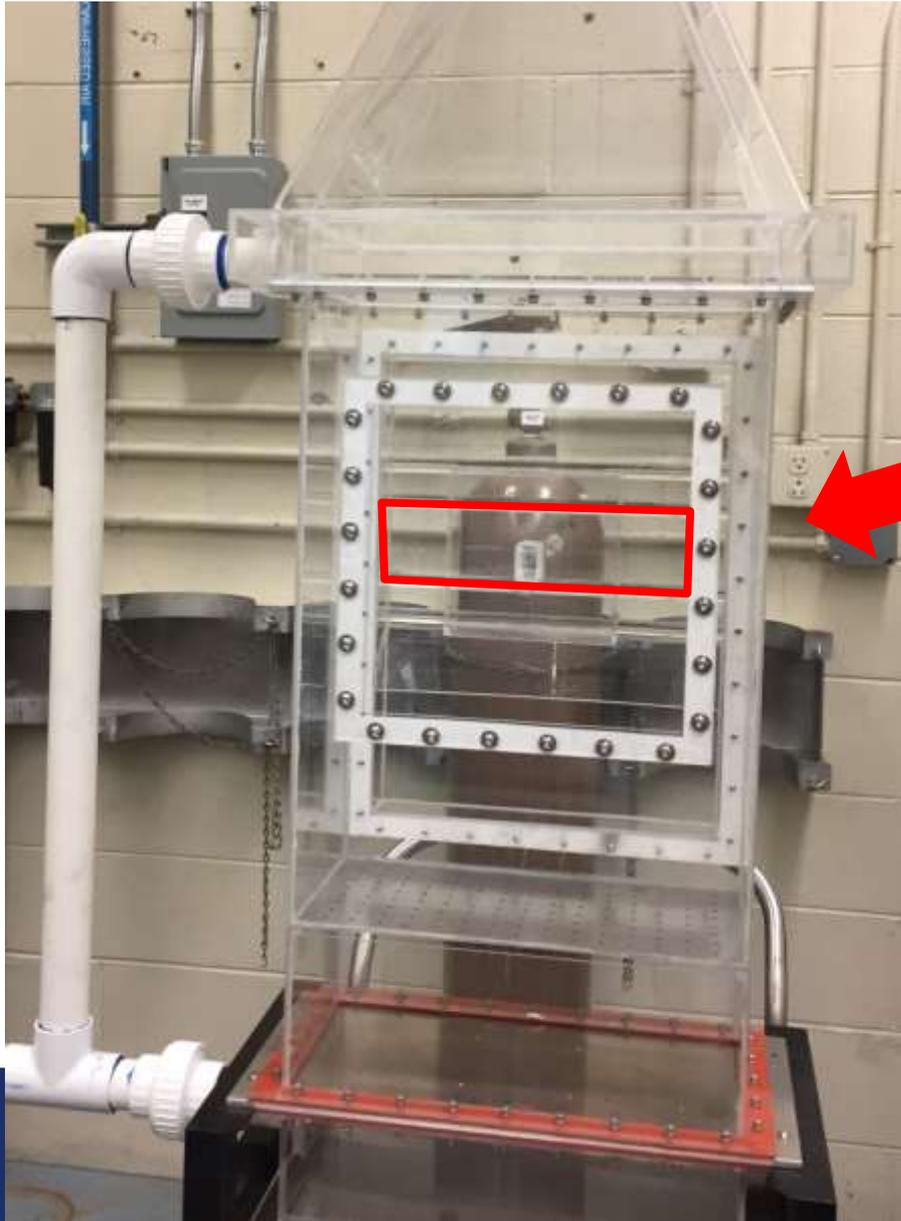


New Test Setup



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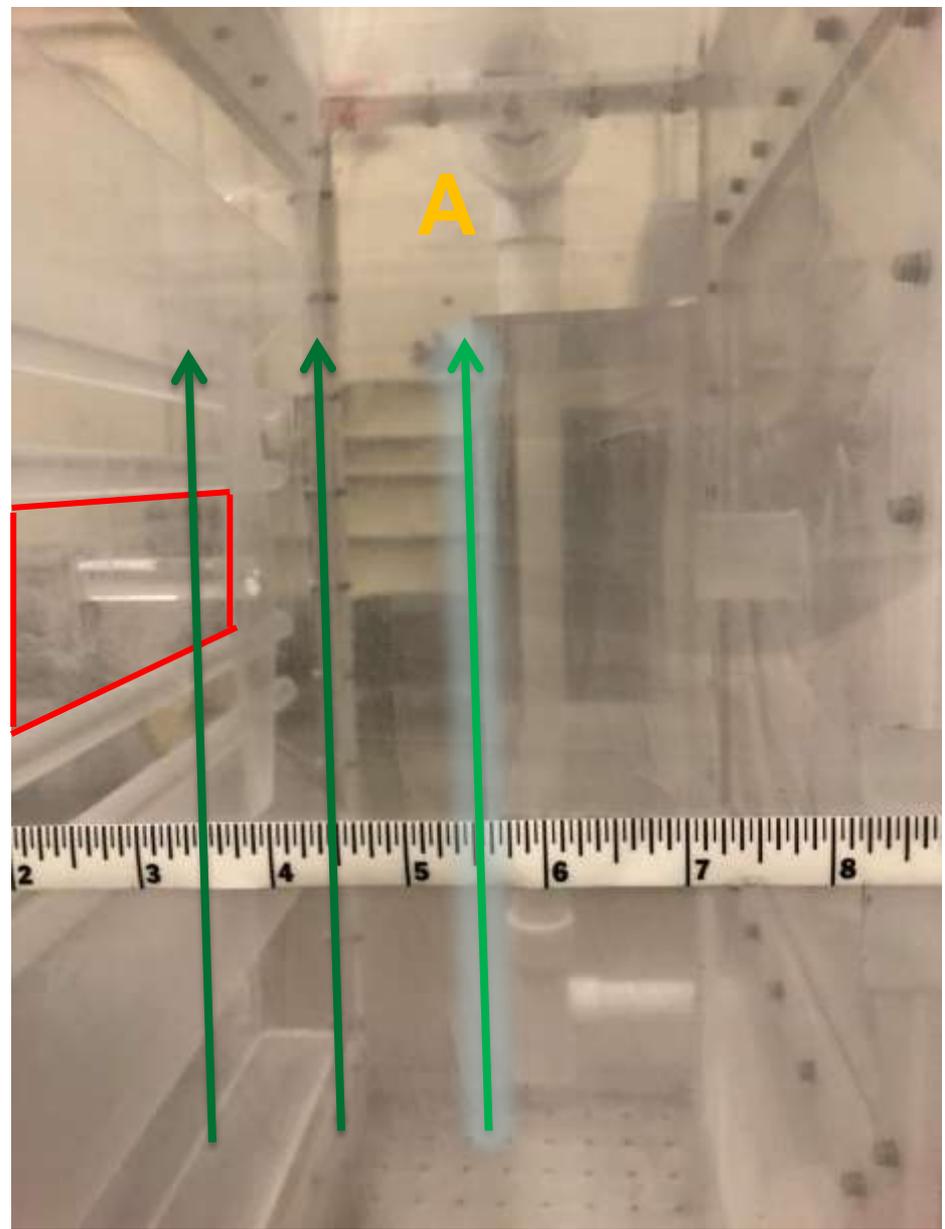
Test Setup 2



The PIV camera is aligned to see between the middle two glow bars

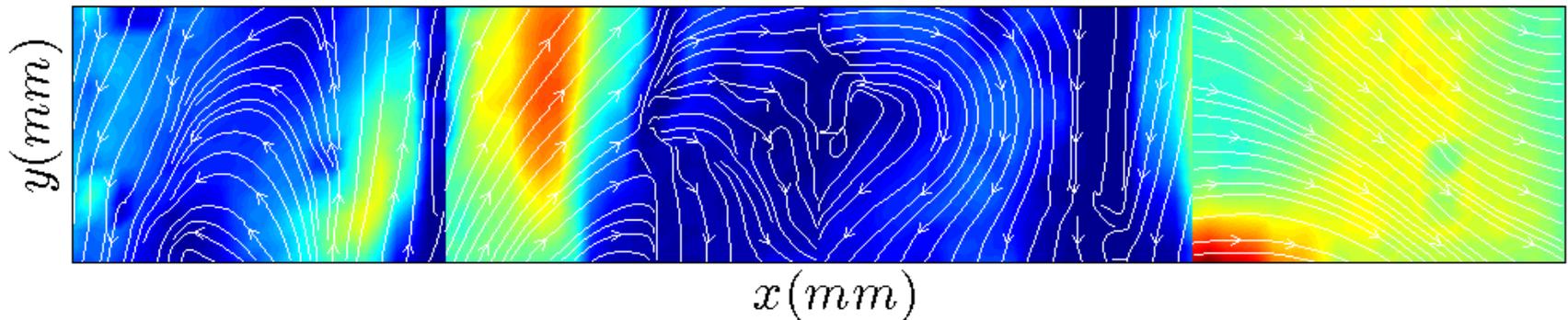


Test Setup 2

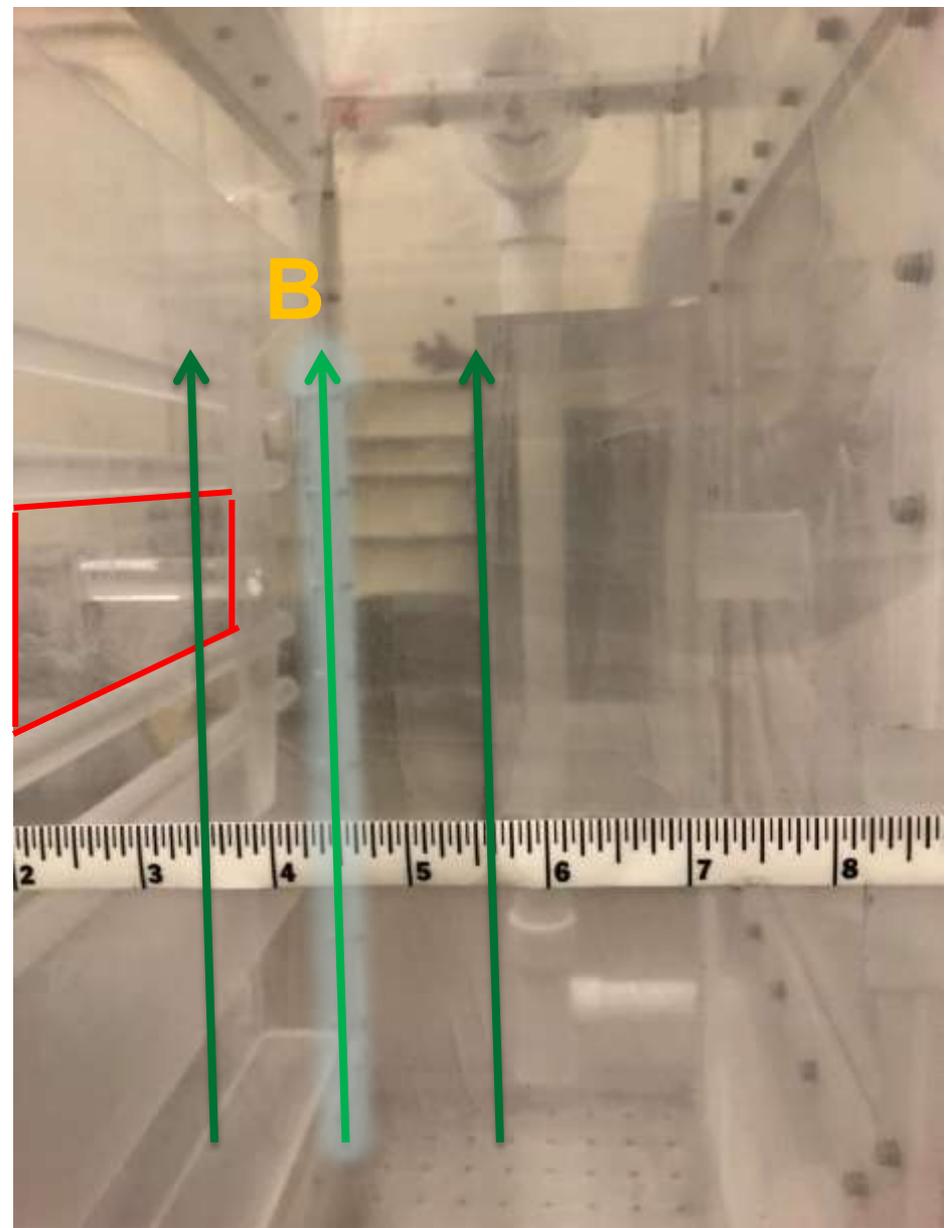


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Air inlet through bottom Reticulated foam filled in Chamber 2 Near Test Sample **A**

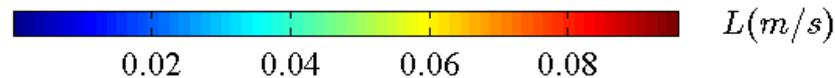
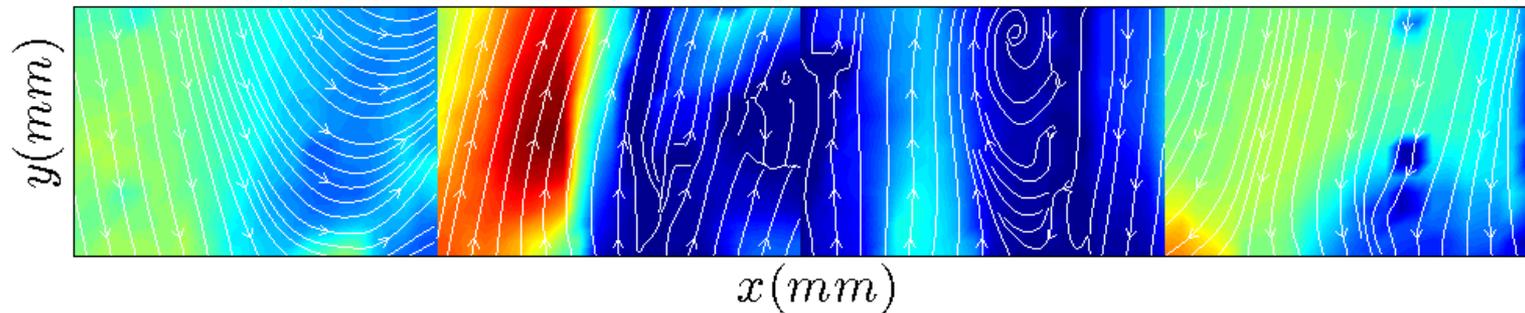


Test Setup 2

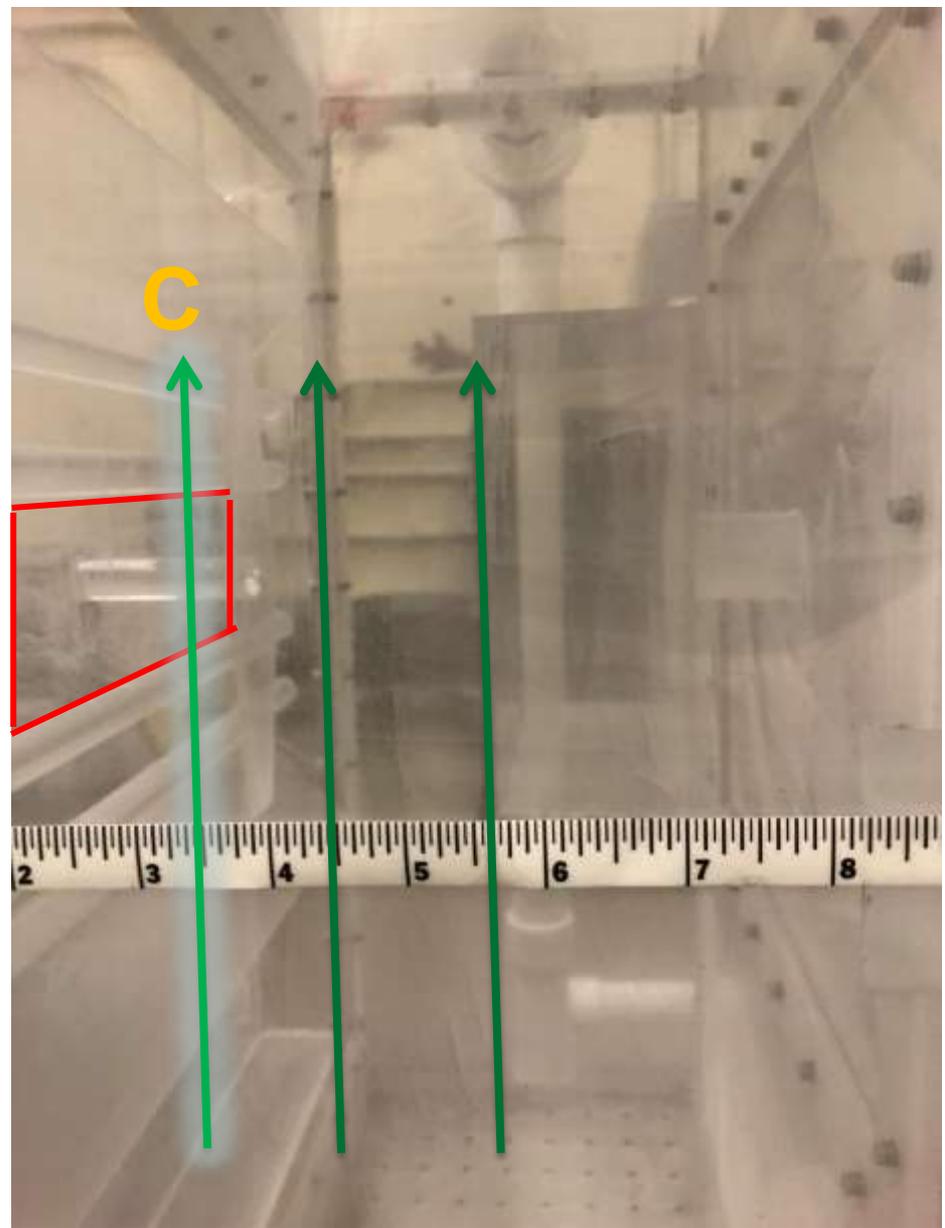


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Air inlet through bottom Reticulated foam filled in Chamber 2 Near Test Sample +1 inch away from test sample **B**



Test Setup 2



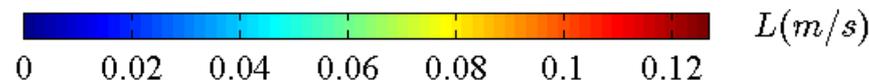
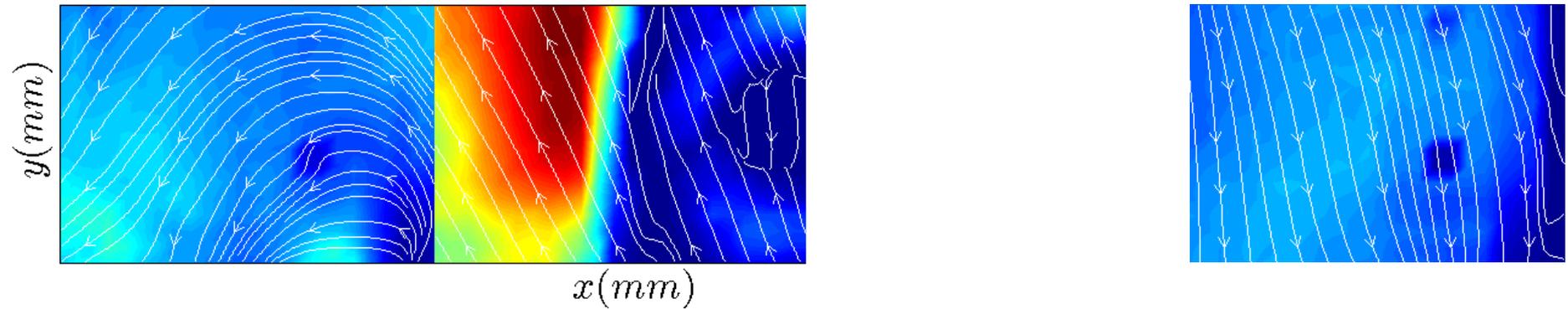
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Air inlet through bottom

Reticulated foam filled in Chamber 2

Near Test Sample

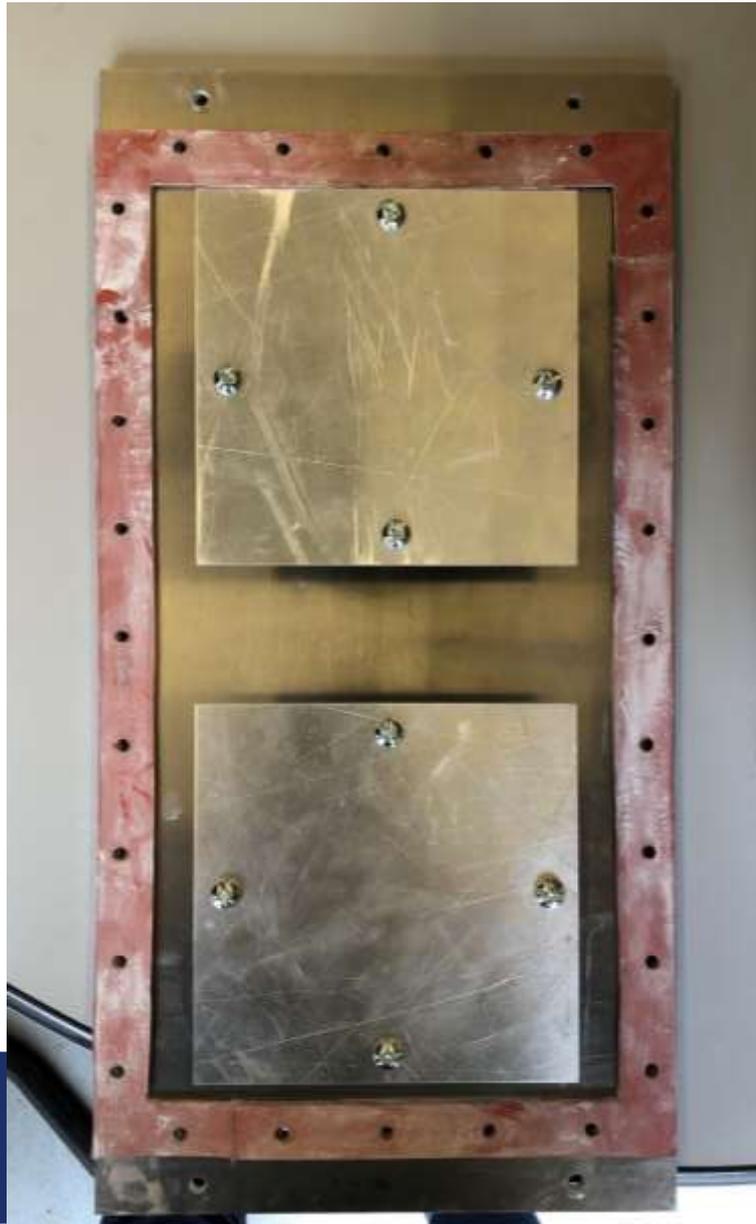
+2 inch away from test sample **C**



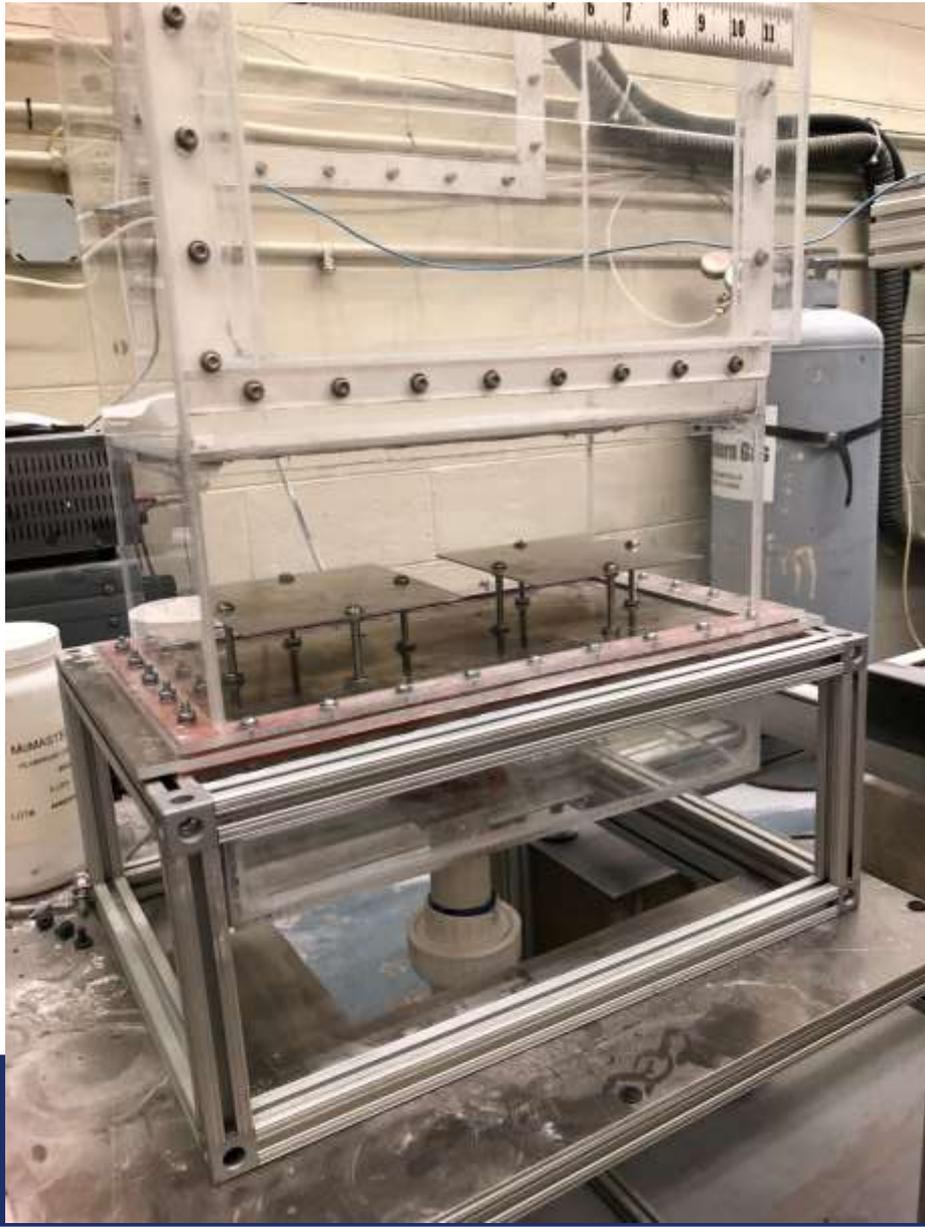
Reticulated Foam when inside the OSU



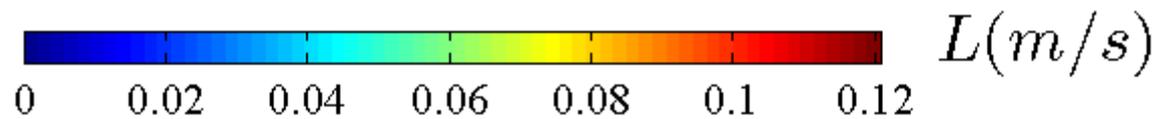
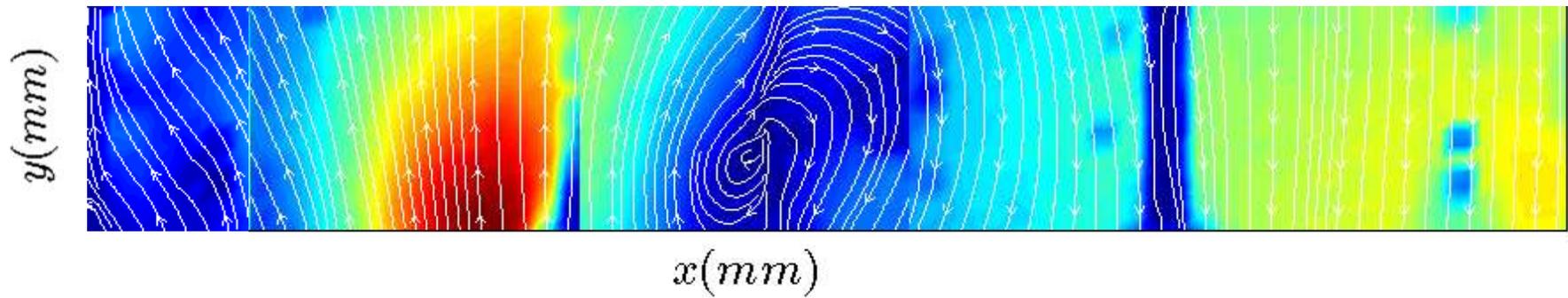
New Setup with Plates



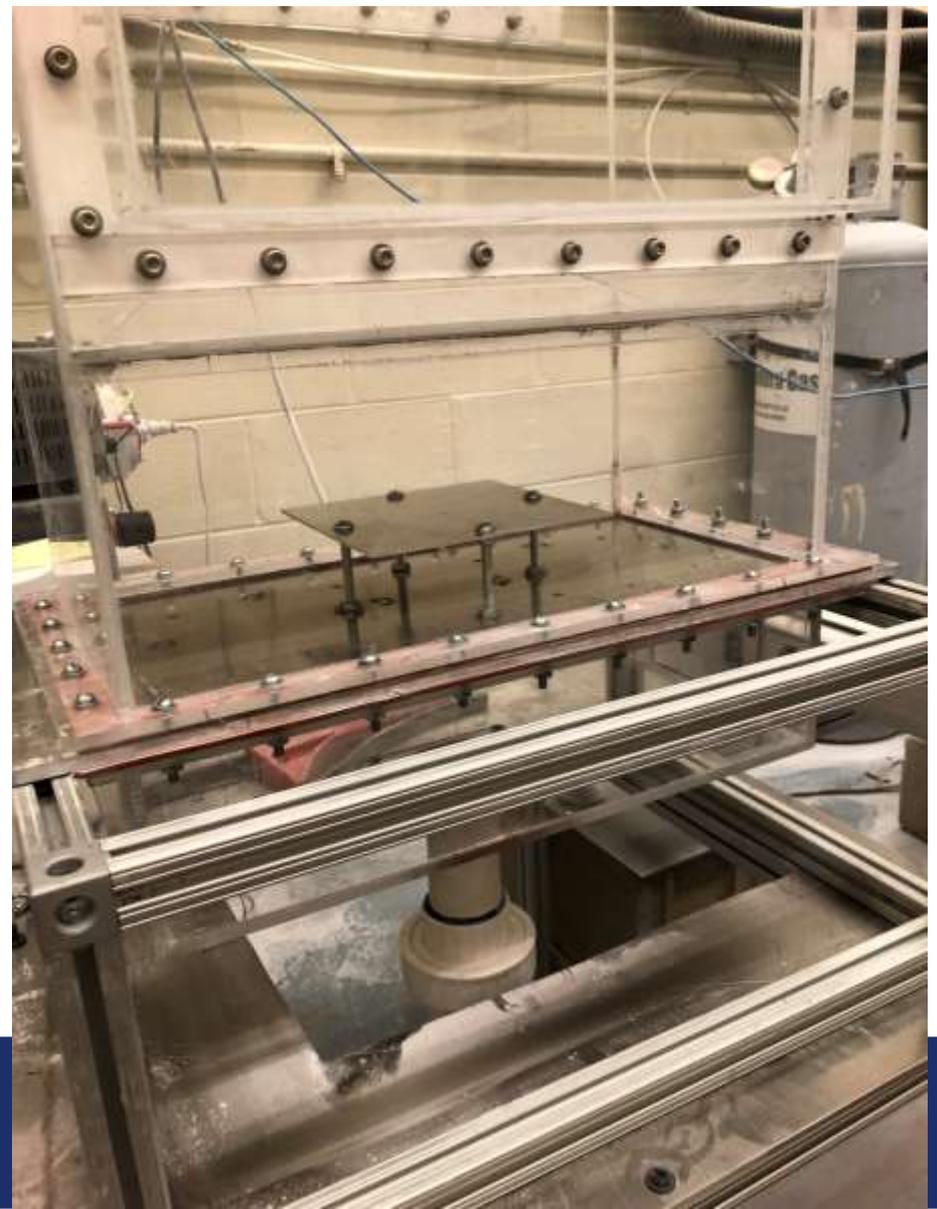
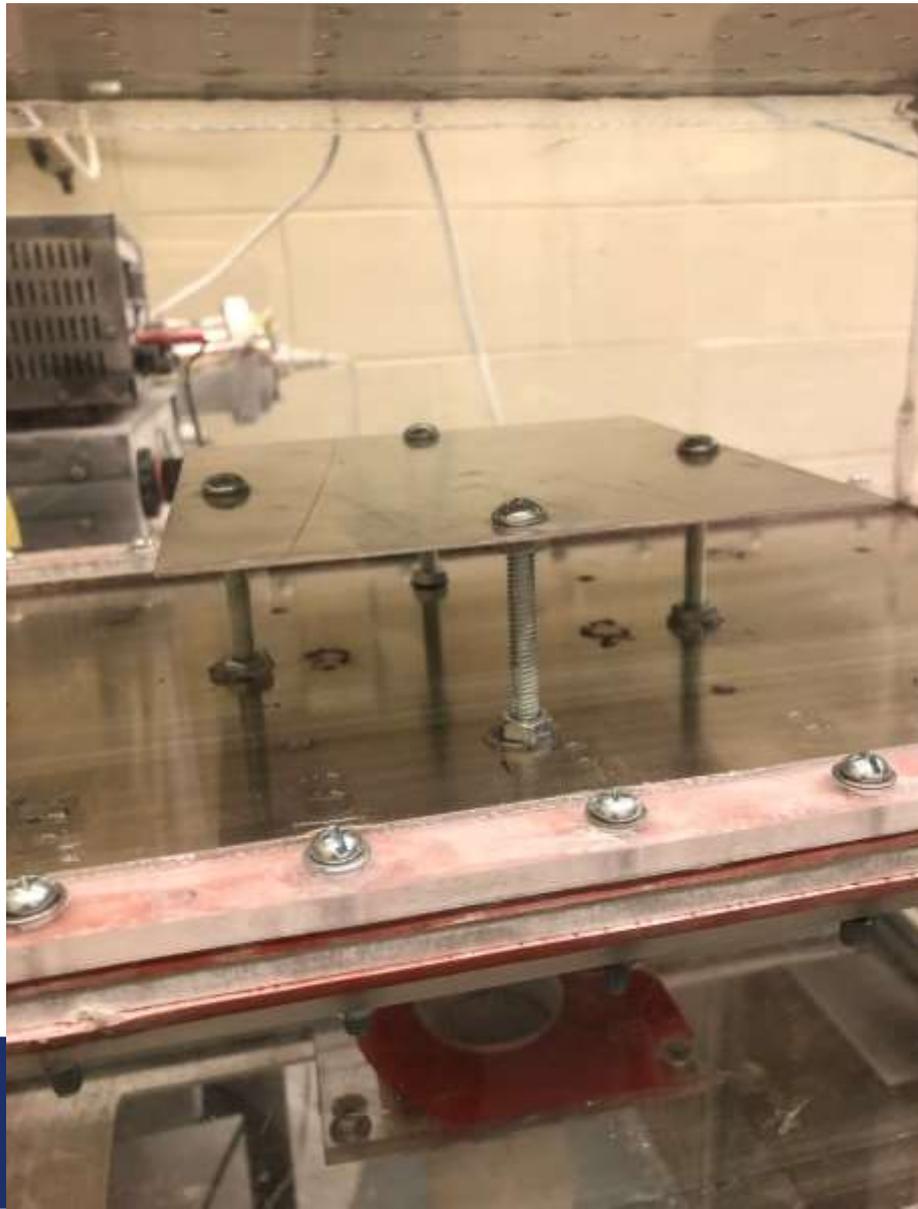
New Setup with Plates



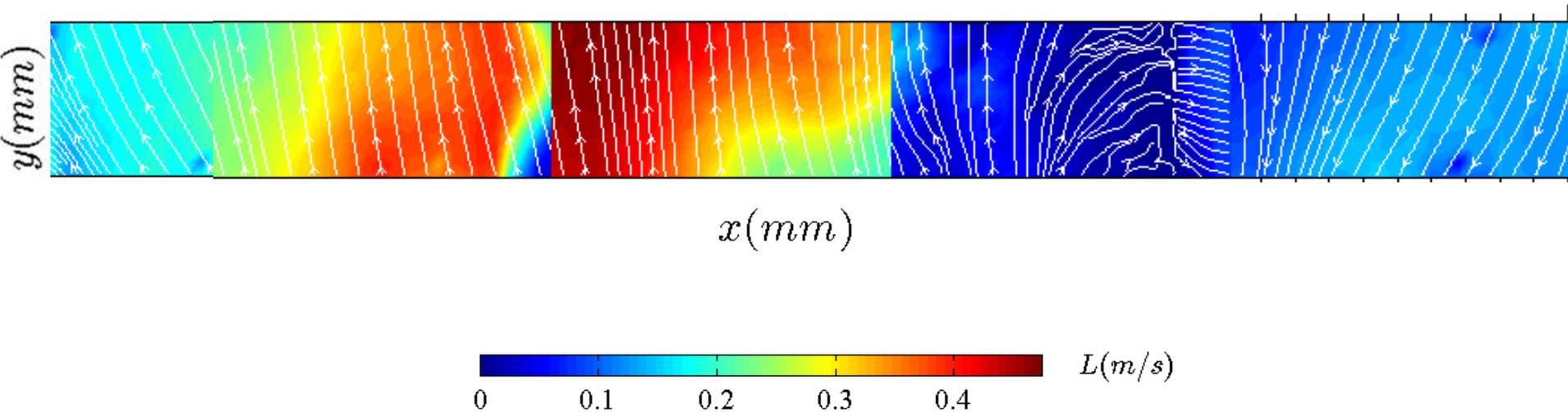
New Setup with Two Plates



New Setup with One Plate



New Setup with One Plate



Will need to re-take data to confirm high velocities, but flow directions are matching with previous tests.



Conclusion

- **There is still an undesired amount of downward motion seen in the tested methods**
- **Will need to continue to test and find the most optimal setup**



Questions or Comments?

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New Near Test Sample Comparison

