MONASH
ENGINEERING

MONASH University

Faculty of Engineering
Summer Research Program 2023-2024

Project Title: Carbon Capture in Cavitating Flows

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Objective

The objective of this project is to experimentally measure the rate at which carbon dioxide diffuses into cavitation bubbles in high-Reynolds number flow through a throttle. These measurements will support the broader aims of an Australian Research Council Discovery Project, which seeks to develop more efficient means of reducing greenhouse gas emissions from electricity generation.

Project Details

In this project, you will have the opportunity to work alongside academics and research staff and make a meaningful contribution to an international research program in the field of thermo-fluids which seeks to find new ways of reducing greenhouse gas emissions. This project will involve set-up and operation of process control instrumentation and high-speed optical diagnostics in the LTRAC Multiphase Flow Laboratory. The objective of the experiment is to measure the formation and collapse of microscopic cavitation bubbles in small nozzles at microsecond time scales, and correlate this with bulk gas mass diffusion rates. In addition to operating experiments, you will gain experience in data analysis and post-processing, and have the opportunity to present your results to the international project team. You will work in the lab alongside a postdoctoral fellow who will ensure safety and provide the necessary training and support on a day to day basis.

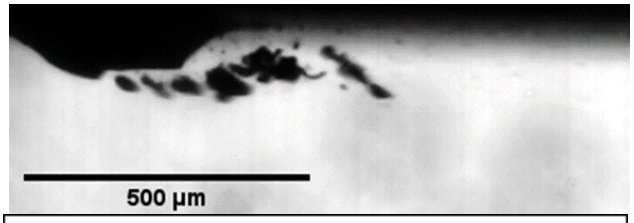

Figure 1. High-speed image of cavitation in a channel with a step (AJ Kusangaya, 2021)

Prerequisites

Applicants should have a strong academic record in thermodynamics and fluid mechanics, and an interest in renewable energy and sustainability. Applicants must have completed MEC2405 & MEC2404, or MAE2402 & MAE2404, or CHE2161 & CHE2164.

Additional Information

Applicants may be required to attend an interview.