

AOCEC fieldwork, March 2020

personal experience

**TRYGVE KVÅLE LØKEN**



My name is Trygve Løken and I am doing my PhD in mechanics at the University of Oslo under Professor Atle Jensen with Professor Aleksey Marchenko from UNIS as co-supervisor. I am writing about interactions between waves and floating ice and the fluid flow around icebergs and ice floes. I very much appreciated the invitation from Aleksey and Nataly Marchenko to participate on the 2020 fieldwork of the AOCEC project, as this could offer a unique hands on experience in my field of interest.

The experience turned out to be unique indeed. Our experimental setup, which was rather novel, proved quite successful. We made an outdoor laboratory on the land fast ice with a basin containing a large ice floe. This floe was towed back and forth to simulate the drifting motion of a natural floe in the marginal ice zone. The collision between the floe and the walls, and the turbulent flow induced in the surrounding waters were measured with various sensors.



*Preparation of the floe. Ice cutting*

The motion of the floe itself was measured with an altimeter, an inertial motion unit and several high sampling rate accelerometers. The fluid motion and turbulence injected into the water from the moving ice floe was measured with conventional acoustic Doppler velocimeter techniques and with a new technique utilizing bubbles as tracing particles, and underwater remotely operated vehicle and image processing technology. These results will probably give us insight in the energy transfer processes between atmosphere, ice and ocean.





*Experiment setup*

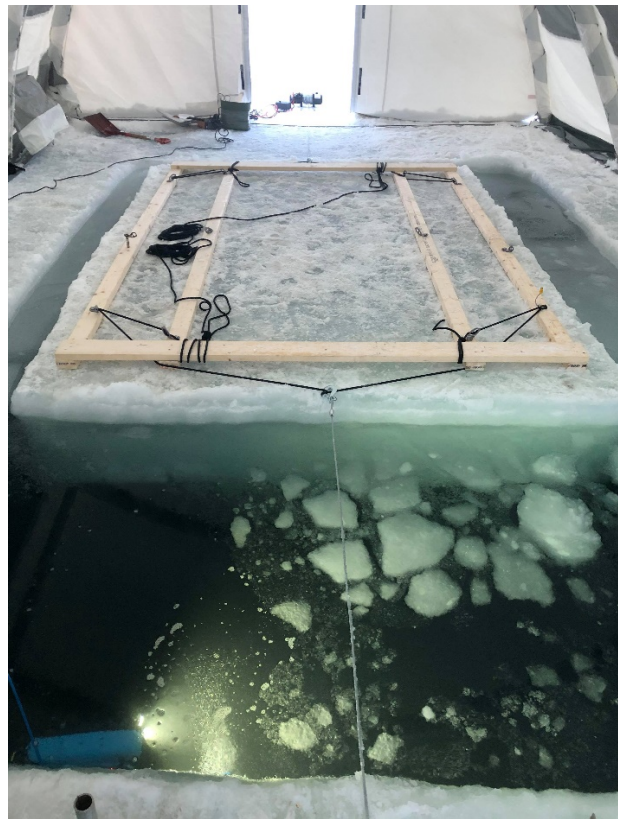
A valuable lesson learned is that Arctic fieldwork is totally different from indoor lab experiments. One can plan the experiment in small details, but unforeseen challenges that must be dealt with, with whatever means available always show up. The cold and wind also affect the physical and mental state of the researchers, so that everything takes longer time to carry out than what was expected. Thanks to the previous experience of Professor Marchenko, we were equipped with a large tent to shelter our setup, and with electrical winches to ease our towing work. With these aids, we were able to carry out the experiments in the cold within the time we had available in the field.



I also very much enjoyed being part of an international research group. At first, I faced some cultural and lingual challenges, but these were quickly overcome as I learned to know my new colleagues. Teamwork under challenging conditions and just the fact of sharing every meal together for ten days builds friendship and professional connections that I look forward to maintaining in my career.

Best regards,

Trygve K. Løken



*Preparation and towing*