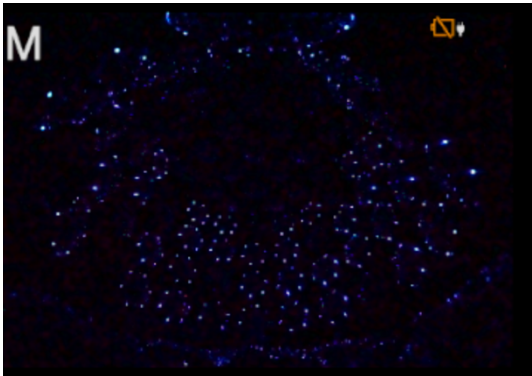
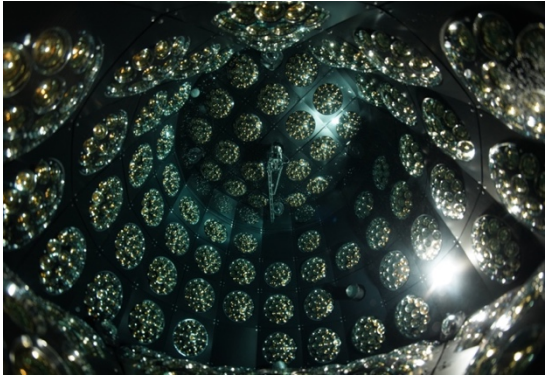
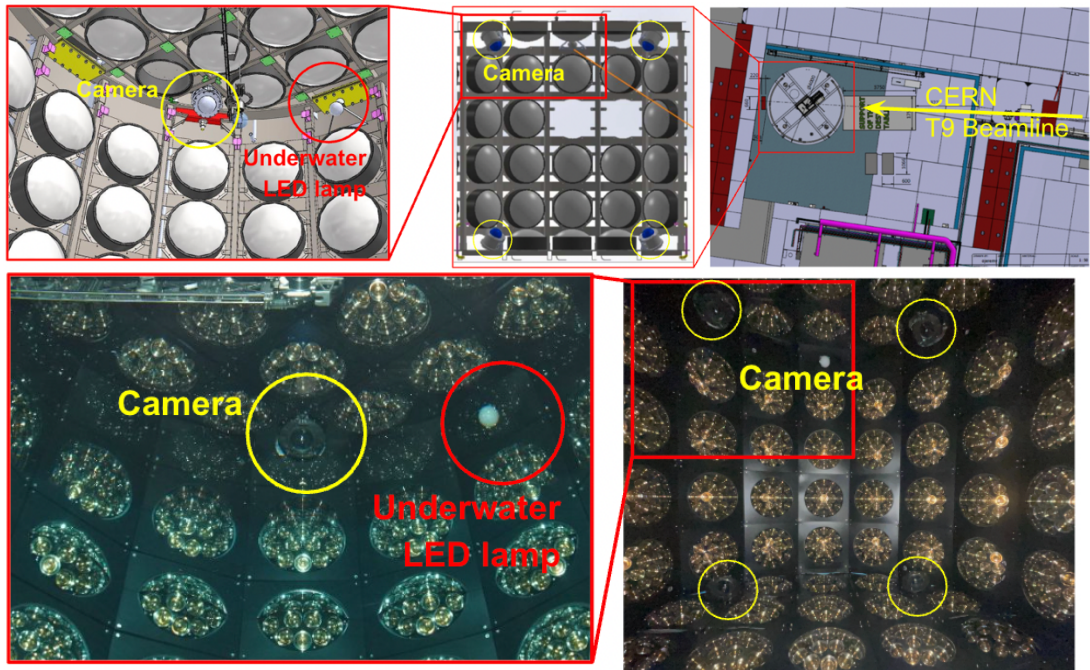


Research Result Report
ICRR Inter-University Research Program 2024

Research Subject: New Photogrammetry Calibration for Super-Kamiokande and Hyper-Kamiokande
Principal Investigator: Patrick de Perio
Participating Researchers: TRIUMF: Xiaoyue Li, Benjamin Smithers IPMU: Ka Ming Tsui University of Winnipeg: Blair Jamieson, Ali Ajmi
Summary of Research Result : Eight camera housings, the prototype of which was tested at Kamioka Lab-F thanks to this grant, were installed into the corners of the WCTE detector as shown in the photo to the right. We successfully took photos of the detector using the underwater lamps (below, left) and the mPMT LEDs (below, right). The data is now being analyzed using the same framework as was developed for SK to obtain a precise position calibration of the mPMTs. 

An overview of the experimental area and detector is shown below, including zoom-in on the camera and lamps, in both the 3D model and actual detector.



The deep-sea red lamp purchased by this grant was used to calibrate the detector water level sensors (from project No. 2024d-I-006) by attaching to an underwater camera, as shown to the right, to take photos of a measuring tape as the water level was varied, as shown in the bottom right. It also acted as a spare for the detector lamps, which were very useful for commissioning the calibration deployment system and water system (initial filling and circulation).

After completion of WCTE this year, the camera housings will be upgraded and will be donated to Hyper-K (IWCD) together with the cameras, electronics, and lamps.

The Super-K analysis and ROV absolute positioning analysis was paused due to these works and after the student and postdoc involved completed their terms. We aim to continue next FY depending on personnel availability.

