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(I) Photogrammetry Calibration of the Super-Kamiokande and Hyper-Kamiokande Detectors

Tuesday, 7 June 2022 16:55 (15 minutes)

Why there exists an asymmetry between matter and antimatter is one of the great mysteries in understanding the evolution of the universe. The discovery of neutrino oscillations by the SNO and Super-Kamiokande experiments opened up an avenue to explore the differences between neutrinos and antineutrinos, potentially shedding light on the mystery. Teasing out this small difference and understanding complicated neutrino interactions will require unprecedented levels of precision provided by a succeeding, next-generation water Cherenkov experiment called Hyper-Kamiokande. To achieve this, I will present the R&D and implementation of a cross-disciplinary approach known as photogrammetry. This talk focuses on the hardware design for Hyper-Kamiokande and analysis pipeline currently being applied to the Super-Kamiokande detector. Through this, we are able to take images of the detectors and aim to pinpoint the positions of their features to the sub-cm level, effectively reducing systematic uncertainties in the modeling of the detectors due to geometrical distortions.

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