

Status of the Hyper-Kamiokande construction

The Hyper-Kamiokande long-baseline neutrino oscillation experiment, currently under construction in Japan, is scheduled to complete its new Cherenkov far detector by 2027, with operations set to begin in 2028. This next-generation detector will be approximately eight times larger than its predecessor, enabling a significant increase in statistical sensitivity—crucial for precise measurements of CP violation in neutrino oscillations.

This scale-up introduces several technical challenges, including large-scale cavern excavation, the construction of the massive water tank, and the underwater installation of advanced readout electronics. Among the most critical challenges is the need to synchronize over 20,000 photodetectors in the tank with sub-100 picosecond precision. Additionally, achieving better-than-100-nanosecond synchronization with the neutrino beam production site at J-PARC is essential for accurate long-baseline time tagging and event selection.

This presentation will provide a broad overview of the ongoing construction, with a particular focus on the technical aspects and solutions being developed for the timing and synchronization systems.