

Significant upgrades of magnetic horn system for J-PARC neutrino beamline towards 1.3 MW beam power

Thursday 18 July 2024 16:45 (18 minutes)

Realization of high intensity neutrino beam over 1 MW beam power is crucial to search for CP violation in Lepton sector. J-PARC accelerator and neutrino beamline are being upgraded towards 1.3 MW beam power for Hyper-Kamiokande experiment. Magnetic horns are used to focus secondary particles produced in a neutrino production target and can intensify the neutrino beam by more than an order of magnitude. Significant upgrades have been made in recent years. Rated current is increased from 250kA to 320kA, which enable to increase the neutrino intensity by 10%, by upgrading almost all the electrical components of the system (power supplies, transformers, etc). Cooling capability has also been improved by developing a new cooling scheme. Reinforcement of removal of hydrogen gas produced from a water radiolysis by intense beams has also been in progress. Details of the upgrades and operation experience, as well as prospects for 1.3 MW operation, are described.

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Author: SEKIGUCHI, Tetsuro

Presenter: SEKIGUCHI, Tetsuro

Session Classification: Accelerators: Physics, Performance, and R&D for future facilities

Track Classification: 11. Accelerator: Physics, Performance, and R&D for Future Facilities