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Reduction of beam loss at the fast extraction section in J-PARC MR

Tuesday 3 June 2025 16:00 (2 hours)

At J-PARC MR, proton beams are supplied to the neutrino facility via fast extraction (FX). The beam power, which was 500 kW in 2021, reached 800 kW by June 2024, with further upgrades planned. This increase in power has led to a rise in beam loss in the FX section, necessitating countermeasures. Residual doses are high at positions where the FX beam orbit closely approaches the aperture, and the effectiveness of beam loss countermeasures is evaluated by changes in residual dose. By June 2024, residual doses were successfully reduced through adjustments to the beam optics. For further reduction of beam loss, in July 2024, the aperture was expanded at the most upstream position where the beam orbit is in close proximity to the aperture. This report discusses the achievements during subsequent FX operations and outlines plans for further improvements.

Footnotes

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Region represented

Asia

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