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High intensity operations of J-PARC accelerators and progress to beyond 1 MW

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In the J-PARC accelerators (400-MeV H- linac, 3-GeV RCS and 30-GeV MR), two projects to increase beam power to more than 1 MW are now in progress. Linac and RCS achieved a 1-MW design beam power for MLF in 2024 with extremely low beam loss. This successful achievement opened a door to further beam power ramp-up beyond 1 MW. The next beam power target for MLF is now set at 1.5 MW, and both beam studies and hardware improvements are being advanced towards the new goal. MR is also in the middle of beam power upgrade to the neutrino experimental facility; we are now increasing beam power while reducing the operation cycle and increasing the beam intensity step by step in line with hardware upgrades, finally aiming to achieve 1.3 MW. The MR beam power ramp-up has been proceeding generally as planned and the routine beam power has now reached 830 kW, exceeding the original design performance of 750 kW. In addition, a 950-kW beam acceleration has also successfully been demonstrated albeit with a single shot. This talk reports on recent efforts and future prospects for increasing beam power beyond 1 MW.

Footnotes

Funding Agency

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Yes

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