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Current status of the cesiated RF-driven negative hydrogen ion source and its R&D activities for future facility projects at J-PARC

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More than a decade has elapsed since the radiofrequency (RF)-driven negative hydrogen (H^-) ion source initiated operation in the autumn of 2014 at J-PARC. Since the 2022/2023 campaign, H^- beams with a beam current of 60 mA have been generated by a single RF-driven H^- ion source in a campaign. The continuous operation time of the ion source reached 4,962 hours in the 2023/2024 campaign. In the 2024/2025 campaign, as of the end of April 2025, a single RF-driven H^- ion source extracts the H^- beams with a beam current of 62.5 mA for the J-PARC users and 75 mA for the accelerator beam studies aiming at the future delivery of the proton beam with a beam power of 1.5 MW to the Materials and Life Science Experimental Facility (MLF), which is currently delivered with a maximum of 1 MW. Concurrently, we are engaged in R&D activities of the ion source for the future J-PARC projects.

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