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# The Mu3e Commissioning Run at PSI in 2025

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The Mu3e experiment at the Paul Scherrer Institute (PSI) will search for the charged lepton flavour violating decay $\mu^+ \rightarrow e^+e^-e^+$, improving the current best limit set by the SINDRUM experiment by four orders of magnitude.

Mu3e will be conducted in two phases. Phase I, currently under construction at the πE5 beamline at PSI, will utilise an intense DC surface muon beam of $10^8$ $\mu^+$/s to reach a sensitivity of $2 \times 10^{-15}$. Phase II will exploit the future High-Intensity Muon Beam (HIMB) to push this further to the $10^{-16}$ level. This improvement is made possible by combining high-intensity muon beams with a low-material-budget tracking system based on ultra-thin HV-MAPS silicon pixel detectors, fast scintillating fibre and tile detectors for sub-ns timing resolution, and a high-rate data acquisition system. Operating in a 1 T solenoidal magnetic field, the detector is optimised for the $\mu^+ \rightarrow e^+e^-e^+$ signature, enabling precise reconstruction of the decay vertex and invariant mass of the three final-state particles.

A commissioning run campaign was conducted in June 2025 at the PSI πE5 beamline as a key step in preparations for Phase I data-taking. This campaign successfully validated critical detector components - including vertex, scintillating fibre, and tile modules - and demonstrated their integration with the high-intensity muon beamline under a 1 T magnetic field. These results represent a major milestone towards readiness for Phase I measurements.

This contribution will present updates and the first results from the recent commissioning run campaign at PSI.

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