

A search for muon-to-electron conversion at J-PARC : The COMET experiment

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The COMET Experiment at J-PARC aims to search for the lepton-flavour violating process of muon to electron conversion in a muonic atom, $\mu^- N \rightarrow e^- N$, with a 90% confidence level branching-ratio limit of 6×10^{-17} , in order to explore the parameter region predicted by most well-motivated theoretical models beyond the Standard Model. In order to realize the experiment effectively, a staged approach to deployment is employed; COMET Phase-I & II. At the Phase-I experiment, a precise muon-beam measurement will be conducted, and a search for $\mu^- N \rightarrow e^- N$ will also be carried out with an intermediate sensitivity of 7×10^{-15} (90% CL upper limit).

The dedicated proton beam-line was recently completed and its commissioning run (COMET Phase- α) was successfully conducted in 2023. In this paper, the construction status and some prospects of the experiment are presented in addition to the experimental overview.

Alternate track

1. Beyond the Standard Model

I read the instructions above

Yes

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