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Muonium R&D at Fermilab

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A new, high-efficiency source of a Muonium beam will be useful for fundamental muon measurements, sensitive searches for symmetry violation, and precision tests of theory. In the PIP-II era, Fermilab has the potential to provide the world's highest-intensity Muonium beam, by a considerable margin. Moreover, with the advent of a muon beam at Fermilab's existing 400 MeV linac, the necessary R&D for such a Muonium facility can begin soon, well before PIP-II is operational.

The physics reach of such a facility includes: a) search for Muonium/anti-Muonium conversion (complementing the Mu2E and MEG experiments); b) precision measurements of the Muonium atomic spectrum (with no hadronic or finite-size effects, and much longer lifetime than positronium); and c) the study of antimatter gravity (>99% of the Muonium mass is in the anti-muon).

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

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