

Precision test of the weak interaction with slow muons

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We propose to use slow muons facilities combined with cyclotron radiation detection for precision test of the weak interaction in the muon decays. Slow positive muon bunches are first injected into a cylindrical superconducting vacuum chamber with uniform strong axial magnetic fields to radially confine the muons. The positrons resulting from muon decays can be detected by their cyclotron radiation, which can be transported to low-noise electronic devices through waveguides coupled to the chamber. The decay positron's energy can be precisely measured down to eV level in the low energy region, which is sensitive to new physics effects such as Majorana neutrinos and new structures of weak interactions.

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