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Direct nuclear probes of neutrino mass¹

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Neutrinos have non-zero mass, as demonstrated by an extensive experimental program in neutrino oscillations. The absolute mass scale of neutrinos, however, remains elusive. In this talk, I will review past and future laboratory-based efforts to measure the neutrino mass directly, with minimal model dependence, through the endpoint kinematics of nuclear beta decays. The KATRIN collaboration expects to begin taking data on tritium within the next year; the Project 8 collaboration has recently demonstrated an important proof-of-principle milestone for a new tritium-based concept; and three collaborations ECHO, HOLMES, and NuMECS are making substantial progress toward a competitive holmium-based measurement. I will discuss some of the technical and scientific challenges faced by each approach, and give an update on the current status of the field.

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