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Precision microwave detection of beta-decay electrons BENJAMIN MONREAL, JOSEPH FORMAGGIO, ASHER KABOTH, Massachusetts Institute of Technology — In order to measure the electron neutrino mass via the tritium beta-decay endpoint, we require extremely precise energy measurements of mildly relativistic electrons. In a magnetic field, these electrons emit coherent cyclotron radiation. Detecting this radiation gives a repeatable, nondestructive measurement of single electron energies and velocities; this may make possible a novel high-precision, low-background tritium experiment, and may have applications in other areas of nuclear physics. In this talk, we outline such an experiment. We discuss some practical aspects of single-electron detection at microwave frequencies, and simulations of the ultimate energy resolution and neutrino-mass sensitivity.

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