

Abstract Submitted
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Magnetic Field and Particle Tracking Simulations for Project 8

DEVYN RYSEWYK, Massachusetts Inst of Tech-MIT, PROJECT 8 COLLABORATION — Project 8 is a new experiment being developed to measure the neutrino mass. The neutrino mass is measured by using the energy of electrons that are emitted from the beta-decay of tritium. Each decay of tritium releases an electron and an antineutrino. Since the beta-decay energy distribution depends on whether the neutrino is massive or not, a measurement of this distribution is equivalent to a neutrino mass measurement. Project 8 will detect the electron energy by looking at the cyclotron frequency of the electron due to the fact that the electron is moving within a magnetic field. Currently, Project 8 is using a NMR magnet and a ^{83}Rb source to see if the proposed experiment would be plausible. ^{83}Rb decays to $^{83\text{m}}\text{Kr}$, and then to ^{83}Kr . Electrons are emitted in the decay of $^{83\text{m}}\text{Kr}$ to ^{83}Kr with the energy of 18 keV and 32 keV. I run magnetic field simulations to characterize the field that the electrons move in and simulations that track electron movement inside the magnetic field. I also work with the prototype and assist with data runs and hardware. I will be presenting field and electron tracking simulations and analysis from data runs.

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