



Contribution ID: 322

Type: Poster

## Experiment Design Progress for a Neutrino Mass Measurement in the R&D Phase of Project 8

Project 8 aims to measure neutrino mass using a method that is conceptually straightforward but technologically challenging. The operating principle is to put tritium in a uniform magnetic field, causing the emitted electron to undergo cyclotron motion and radiate. Measuring the electron's radiation frequency yields its energy, and the energy spectrum constrains the mass of the neutrino involved in the decay. This method has worked in a small waveguide, but to improve neutrino mass sensitivity it needs to be demonstrated in a large free-space volume. The next phase of this experiment will be done in a medical MRI magnet with an array of antennas viewing the tritium volume. Detection is challenging because a single electron emits  $<1$  fW at  $\sim 26$  GHz. This poster shows how high-frequency simulations of this complex system have driven design progress in the antenna, cryogenic, and mechanical subsystems.

### Mini-abstract

R&D towards measuring neutrino mass in Project 8 using electrons spiraling through a magnetic field

### Experiment/Collaboration

Project 8

**Primary author:** TELLES, Arina (Yale University)

**Presenter:** TELLES, Arina (Yale University)

**Session Classification:** Poster Session 1