



Contribution ID: 134

Type: Poster

## Towards a Neutrino Mass Measurement: the Project 8 Experiment

The Project 8 experiment aims to measure the neutrino mass using tritium beta decays. Beta-decay electron energies will be measured using the beta-decay electrons' cyclotron radiation: as the electrons travel in a uniform magnetic field, the frequency of the cyclotron radiation is inversely proportional to their total relativistic energies. By observing the cyclotron radiation we can make a precise measurement of the electron energies. The advantages of this technique include scalability, excellent energy resolution, and low backgrounds. The Project 8 Collaboration is using a prototype experiment to study the feasibility of the technique with a  $^{83m}\text{Kr}$  source. Demonstrating the ability to see the 17.8-keV and 30.2-keV conversion electrons from  $^{83m}\text{Kr}$  will show that it is possible to measure tritium beta-decay electron energies ( $Q \approx 18.6\text{-keV}$ ) with their cyclotron radiation. This poster highlights the progress on the prototype device, the signal-extraction techniques under investigation, and future plans for the experiment. This research is supported in part by DOE grant DE-FG02-97ER41020, the National Science Foundation, and the Laboratory Directed Research and Development Program at Pacific Northwest National Laboratory.

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**Track Classification:** Neutrino Mass