

## Project 8: Measuring the Tritium Beta-Decay Spectrum using Cyclotron Radiation Emission Spectroscopy

Cyclotron Radiation Emission Spectroscopy (CRES), a frequency-based method for determining the energy of relativistic electrons, has recently been demonstrated by the Project 8 collaboration. Applying this technique to the tritium endpoint provides a new avenue for measuring the absolute mass-scale of the neutrino. The proof of principle was done in a small waveguide detector using gaseous  $^{83\text{m}}\text{Kr}$  as a source of monoenergetic electrons. As the next step towards a neutrino mass measurement, we have upgraded the existing detector to operate using a molecular tritium source, and to have enhanced radiofrequency properties. Here we discuss the hardware upgrades made to further the capabilities of the CRES technique and the data-analysis challenges faced during the second phase of the Project 8 experiment. We describe our commissioning activities with  $^{83\text{m}}\text{Kr}$  and our progress towards making a measurement of the tritium spectrum.

### Authorship annotation

for the Project 8 Collaboration

### Session and Location

Monday Session, Poster Wall #14 (Robert-Schumann-Room)

### Poster included in proceedings:

yes

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**Track Classification:** Poster (participating in poster prize competition)