

## Concept for an Atomic Tritium Experiment: Phase IV of Project 8

Spectral broadening caused by molecular degrees of freedom, about 1 eV FWHM, limits the sensitivity of neutrino mass experiments using the  $T_2$  molecule. The high-resolution Cyclotron Radiation Emission Spectroscopy (CRES) method developed in Project 8 makes an atomic T experiment attractive. The basic ingredients of a conceptual design are presented: a dissociator to make T from  $T_2$ , an accommodator to cool the atoms to a temperature in the range 30-60 K, and a velocity and state selector of low-field-seeking hyperfine states in a narrow velocity band. An equilibrium density can be maintained in a magnetic bottle with a small, magnetically-defined entrance aperture. Inside the bottle are a central uniform magnetic field, and RF antennas to read out the CRES signals. Demonstrator systems to test the concepts are planned or in progress.

### Authorship annotation

Alec Lindman for the Project 8 Collaboration

### Session and Location

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yes

**Primary author:** LINDMAN, Alec (Universität Mainz)

**Presenter:** LINDMAN, Alec (Universität Mainz)

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