

Abstract Submitted
for the APR16 Meeting of
The American Physical Society

Moving to atomic tritium for neutrino mass measurements¹ KAREEM KAZKAZ, Lawrence Livermore Natl Lab, PROJECT8 COLLABORATION — For direct measurements of the neutrino mass, the tritium-based experiments Mainz and Troitsk have provided the most sensitive measurements to date, with upper limits near 2200 meV. The KATRIN experiment, beginning its first science run in 2016, also uses tritium as its source and has an anticipated ultimate sensitivity of 200 meV. The largest single systematic effect limiting the mass sensitivity beyond KATRIN is the energy sharing between the emitted beta particle and the resulting T-3He molecule. It therefore behooves all future tritium-based experiments to use atomic, rather than molecular, tritium. In this presentation we will outline experimental considerations of atomic tritium: production, purification, inhibiting recombination, and cooling. We will discuss these considerations within the context of Project8, a tritium-based, cyclotron radiation emission spectroscopy neutrino mass measurement with an ultimate target sensitivity of 50 meV.

¹Prepared by LLNL under Contract DE-AC52-07NA27344.

Kareem Kazkaz
Lawrence Livermore Natl Lab

Date submitted: 07 Jan 2016

Electronic form version 1.4