

Abstract Submitted
for the DNP06 Meeting of
The American Physical Society

NEXTEX- The next generation of electron anti-neutrino mass experiment¹ JACEK BORYSOW, Michigan Tech University, MANFRED FINK, The University of Texas at Austin, HERMANN WELLENSTEIN, Brandeis University, TIMOTHY GAY, University of Nebraska at Lincoln, RICHARD MAWHORTER, Pomona College — The design and progress towards meeting the objectives of the Neutrino Mass Experiment in Texas (NEXTEX) is presented. The mass of the electron antineutrino will be inferred from the beta endpoint energy spectrum from gaseous tritium molecules with precision of at least 0.5 eV. Two differential electrostatic spectrometers will be used to analyze the beta electrons near the endpoint energy with 1 eV resolution. The mass of the neutrino will be deduced following the deconvolution of the well established Fermi function and the measured spectrometer function. The correlations between electrodes' potentials and the energy of the transmitted electrons will be determined with high energy electron diffraction on the T₂ gas. The differential cross section exhibits an oscillatory pattern due to the coherent scattering from the two atoms forming T₂. This procedure will provide a series of calibration markers for the spectrum with uncertainties of about 100 meV. The background of less than one count a day, at the detector have been demonstrated. The isotopic purity of tritium is monitored by a novel, laser diode based Raman Spectrometer.

¹Supported by NSF grant PHY-0457194.

Jacek Borysow
Michigan Tech University

Date submitted: 27 Jun 2006

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