

Mass Measurements of ^{23}Na and Beamline Upgrades for TAMUTRAP Facility

The Texas A& M University Penning Trap (TAMUTRAP) facility was designed to test the Standard Model by studying the $\beta^+-\nu_e$ angular correlation parameter of superallowed β -delayed proton decays. Currently, the trap is being commissioned by utilizing stable isotopes to perform precision mass measurements. Using the prototype trap, we performed mass measurements of ^{23}Na by analyzing the time-of-flight and resonance frequency of the ions. We found the mass of ^{23}Na to be 22.989766(12)u which agrees with the literature value within a precision of 1.5×10^{-7} . After performing these measurements, we implemented several upgrades to the hardware of the facility. This included the cleaning, assembling, and installation of a spherical deflector and beam steerer. Additionally, an attempt to realign Section I of the TAMUTRAP beamline was made using an optical transit technique to prepare the Penning trap to receive radioactive beam from the K150 cyclotron. We found that to be fully aligned, we need to shift section II of the beamline as well, which will be done in the Fall. Finally, the new, full-sized Penning trap was cleaned, assembled and preliminary tests were conducted to prepare for its installation.