

Assembling, cleaning, and testing a unique open-ended cylindrical penning trap (TAMU TRAP)

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A new experimental beamline containing a prototype cylindrical penning trap has recently been constructed at the Cyclotron Laboratory at Texas A&M University. The new beamline will enable precision experiments that enhance our understanding of the limits on non-SM processes in the weak interaction through the measurement of the β - ν correlation parameter for $T = 2, 0^+ \rightarrow 0^+$ super allowed β -delayed proton emitters. The prototype TAMUTRAP consists of an open-ended cylindrical penning trap of diameter of 90 mm with gold-plated electrodes of oxygen free high conductivity copper to prevent oxidation. The trap's electric quadrupole field is provided by a SHIP TRAPS RF electronic circuit to the four segmented electrodes at the center of the trap while the trap's 7 Tesla magnetic field is provided by an Agilent 210 mm ASR magnet.

A discussion of the assembly of the TAMU TRAP, the experimental set up, and alignment of the beamline will be presented. The method used to test the prototype penning trap using an ion source, Faraday cups, and Micro-channel plate (MCP) detectors will also be discussed.