

Designing an Ion Beam Laboratory and Ion Source

Braden Long

TTU Civil Engineering

A university ion beam laboratory for stable beams is designed and currently under construction. The beamline will have multiple uses, such as studying the ionization schemes, as well as beam polarizability. The beamline will be under high vacuum and is made up of a multitude of components that were acquired from the former HRIBF facility and are being modified and repurposed. The components include a low energy ion source, a beam analyzer, an RFQ chamber, a dipole magnet to change the direction of the beamline, and two chambers to conduct the laser spectroscopy and other measurements. These components are mainly powered via a high voltage platform. The high voltage platform itself is powered by a high-powered motor and generator. In creating a working product, steps were taken to make sure that the beam-line layout allows for the maximum use of the components within the limited laboratory space while still allowing for flexibility in easily reconfiguring the beam line for different applications. This work will describe the design process, the components involved, and the factors considered in the layout of the beam line.