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Beam scattering through foil

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This paper describes the foil structure used at the beam extraction point in the NASA Space Radiation Laboratory (NSRL) beamline. The stripping foil removes electrons from incoming ions, rendering them partially or fully stripped. Foils of various materials and thicknesses are employed, enabling ion species at different energies to pass through. As charged particles traverse a foil, the outgoing particles exhibit a Gaussian-like angular distribution. This distribution is subsequently transformed into a uniform profile by a set of octupole magnets, essential for various beam experiments at the NSRL target.
We utilize the Bmad and SRIM computer codes to calculate the energy loss through the foils for different ion species, energies, and charge states. After preparing ion beam species in the Booster, we determine the energy loss by measuring the horizontal beam profile at the multi-wire MW063 location in the NSRL beamline. Finally, we present a summary of energy loss calculations obtained through Bmad, SRIM, and experimental data.

Footnotes

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