

Biasing Wire Scanners and Halo Scrapers for Measuring 6.7-MeV Proton-Beam Halo

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Abstract

Wire scanners and halo scrapers (WS/HS) were used to acquire projected beam distributions over a very wide dynamic range in order to determine the extent and study the formation of beam halo at the Low Energy Demonstration Accelerator. To detect beam distributions over a large dynamic range, it was necessary to understand the effects of WS/HS biasing for optimizing wire and scraper signal amplitudes. Both wire scanners and halo scrapers were biased with both positive and negative potentials to ± 200 V. WS/HS depleted-charge data were acquired at these different potentials and the amount of signed charge leaving or accumulating on the wire or scraper was measured. This paper will show these data, and will offer a discussion of an optimal biasing potential for these types of projected beam profile measurement devices.