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Development of the 30 keV Proton Source and Detector Systems at the University of Manitoba for the Nab Experiment[1] RUSSELL MAMMEI, The University of Winnipeg, NICK MACSAI, WOLFGANG KLASSEN, MICHAEL GERICKE, The University of Manitoba, NAB COLLABORATION —
The "Nab" collaboration will perform a precise measurement of the neutron beta decay parameters "a" and "b", which constitutes a test for physics beyond the standard model. The experiment makes use of the fundamental physics cold neutron beamline at the Spallation Neutron Source at the Fundamental Neutron Physics Beam Line. This experiment requires very efficient and precise detection of low energy (30 keV) protons with large area Si detectors. To this end, a 30 keV proton source has been built at the University of Manitoba (UofM) to characterize the Si detector with respect to a custom large area (150mm x 150mm) microchannel plate detector, with known detection efficiency. During development of the MCP detector, a large area (200 mm diameter) phosphor screen has been employed to characterize the steering mechanism of the proton beam. This talk will introduce the 30 keV proton source at UofM and present the steering mechanism results as measured by the phosphor screen and microchannel plate detector.

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