Contribution ID: **30** Type: **not specified**

Position Sensitive Detector Development for use in the Rare Radio-Isotope Ring

Monday, 17 August 2020 15:30 (15 minutes)

In accelerator physics, particle beams require constant fine tuning for nominal operation. As such, beam monitoring carries great importance. Detectors with position measurement capabilities are required to enact such beam diagnosis whilst causing minimum disruption to the beam quality. A detector of this type is required at the Rare Radio-Isotope Ring at the Radio Isotope Beam Factory (RIBF) in Japan, specifically with a large effective area, to extract position information. This must achieve the positional resolution of the current standard detector to be successful. A Delay Line Electric-field Micro Channel Plate type Detector was chosen for its precision potential while maintaining such a large area. The chosen detector is described along with motivations and improvements that will be made to increase its resolution. In addition, a section considering non-destructive techniques for monitoring the beam are evaluated with regards to their potential use at the RIBF. It is deemed that most are too underdeveloped however the cavity beam position monitor holds exciting potential.

Field of your work

Experiental nuclear physics

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Session Classification: Young Scientist Session 1