

Development of fast-response and high-resolution position detector for high-intensity RI beam

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High-intensity radioactive isotope (RI) beams provide various opportunities to perform important studies of nuclear physics. In the experiment, position detectors have an essential role in the measurement of momentum and emittance, and particle identification. Common technique used for position deduction in conventional detectors such as Delay-line parallel plate avalanche counter (DL-PPAC) and Multi-wire drift chamber (MWDC) is based on time difference between the arrival time of the particle at the detector and the signals at the read-out circuit. However, in this method, the pile up of signals is not negligible when the beam intensity is about 10^6 Hz owing to the signal delay.

We have developed Strip-Readout PPAC (SR-PPAC) for the achievement of almost 100% detection efficiency even for the high-intensity RI beam near 10^6 Hz.

Fast electron pulses collected directly from each strip of the cathode and the distribution of induced charge on the electrode are used for the position deduction.

The principle of SR-PPAC and its performance evaluation will be presented in this talk.

Field of your work

Instruments

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