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Beam intensity measurement with secondary electron emission foil in comparison to fast current transformer.

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The task of the Particle Detector Combination detectors is to measure the beam intensity of slowly extracted ion beams. The complete range of possible beam intensities at FAIR cannot be covered by single detector type. At GSI this task is accomplished by a combination of three detectors, a plastic SCintillator (SC), an Ionization Chamber (IC) and a Secondary Electron Monitor (SEM).
The SEM detector measures the amount of secondary electrons excited during the passage of charged particles through matter. The secondary electron yield for a single beam ion is experimentally determined by first calibrating the IC detector relative to the SC. In a second measurement the SC detector is removed and the beam current is increased. The SEM secondary electron current is measured as a function of the beam intensity, determined by the IC.
In this contribution we present an alternative approach for calibration of the SEM detector with fast extracted ion beam. The secondary electron yield is experimentally determined by comparison of the SEM and Fast Current Transformer signals.

Summary

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