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Absolute charge measurements with pick-ups

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Capacitive Pick-Ups (PUs) are typically used for monitoring the beam position and measuring the relative intensity of bunched beams. We explore the potential usage of capacitive PUs for measuring the absolute charge in a bunch over the full range of beam energies, transverse beam offsets and bunch lengths found at ion accelerators. The results suggest that absolute charge measurements can be performed, however a correction specific to the design and installation of PUs is required.

In this contribution, the field simulation results for a typical PU design installed at GSI UNILAC and CRYRING@ESR for a standard beam parameter range are shown. Historical experimental data from comparative measurements between PUs and current transformers performed at CRYRING@ESR support the simulation results.

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