

Design of a beam current monitoring system for a compact LINAC accelerator

The instrumentation used to measure the parameters or diagnostics of the beam is an essential part of any particle accelerator. Beam diagnostics play a key role in the operation of the accelerator, and are necessary to determine the performance of the source. The aim of this article is to present a design for one type of beam diagnostics tool, the Faraday cup, which can be used to measure the charged particle current directly. This system is designed and developed in the form of a prototype. Our design is described with a focus on the beam energy in the range 5–50 MeV. To select appropriate types of material to ensure good performance, the well-proved PHITS Monte Carlo code was performed. Monte Carlo simulation is one of the most important methods of simulating the distributions of the energy deposition and the charged particles of the incident electrons. The optimal size and the overall system of use of our Faraday cup are also described.

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