

Absolute calibration of second emission monitors at CERN

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The secondary emission beam monitors of the North Area at CERN (BSIs) form a vital component in the delivery of stable beams to experiments and users. Located in the primary beam lines, these monitors operate by integrating low-energy secondary electrons emitted proportionally to the charged particle flux. In turn, the absolute calibration of these monitors plays a key role in their operation. One possibility is installing an activation foil in the proximity of the detector to be calibrated, exposing it to a substantial fluence, and then measuring by gamma spectrometry the activity of key isotopes generated in those foils. By comparison of those activities with cross-section values from literature, an absolute proton flux through the activation foil can be derived.

In 2022, a first calibration of the BSI monitor at the T10 target station was made using aluminium and copper foils, resulting in an agreement of $99.1 \pm 1.8\%$ between the fluence integrated by the monitor and the activation foil. The method was further extended to calibrate the monitors of the three target stations located in the TCC2 cavern: T2, T4 and T6. The contribution will focus on the method of calibration of the monitors and on the experience gained, and will present some of the difficulties encountered in the various calibration runs attempted.

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