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The study of high-frequency pick-ups for electron beam position measurements in the AWAKE common-beamline

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The common beamline of the AWAKE experiment at CERN involves the co-propagation of two particle beams: protons with 48 nC bunch charge and 250 ps bunch length, and electrons with up to 600 pC bunch charge and approximately 4 ps bunch length. The existing operational beam position monitors at AWAKE cannot measure the electron bunches whilst the more-intense proton bunches are present, due to their low operating frequency. In order to try and address this challenge, two high-frequency pick-ups were studied. These included the conical shape button pick-up and the Cherenkov diffraction radiation-based pick-up designed to operate at 30 GHz. Both devices were installed at AWAKE and were connected to two identical read-out systems designed by TRIUMF. This contribution presents and discusses the results obtained from beam-based measurements during the current experimental year

Footnotes

Funding Agency

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Yes

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