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Electron bunch position determination using a high frequency button beam position monitor in the AWAKE facility

Tuesday, 10 September 2024 16:00 (1h 30m)

The AWAKE facility uses novel proton beam-driven plasma wakefields to accelerate electron bunches over 10m of Rubidium plasma. Precise monitoring of 2 diverse beam types necessitates an electron beam position monitor (BPM) working in a frequency regime of tens of GHz. A high frequency conical button-style BPM with a working regime of up to 40 GHz has been investigated as a way to discriminate the electromagnetic fields of 19 MeV, 4 ps electron bunches propagating spatially and temporally together with a 400 GeV, 170 ps proton bunch in the AWAKE common beamline. The sensitivity of the HF BPM to the electron beam position is determined under various beam conditions, with both electrons and protons, and integration with a TRIUMF front-end is discussed.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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