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A 3GHz Wall Current Transformer for Very High Bandwidth Beam Current Measurements

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Non-destructive beam current measurements are a crucial aspect of beam instrumentation in any particle accelerator. Often, these measurements must be capable of distinguishing individual beam pulses. In an increasing number of accelerators, pulse repetition rates reach the GHz range. Consequently, beam current measurement bandwidth must exceed a few GHz. To meet this requirement, a wall current transformer was developed with a bandwidth exceeding 3 GHz. It was tested using a vector network analyzer and with an electron beam at CERN's CLEAR facility. Both measurements showed excellent agreement. We introduce the wall current transformer principle and discuss the measurement results. Additionally, we highlight some challenges that must be addressed when measuring high-frequency signals.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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