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Bunch-by-bunch beam position measurements at PETRA III

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The PETRA IV project is set to enhance the current PETRA III synchrotron into an ultra-low-emittance source. The reduced emittance will impose stringent requirements on machine stability and operation. In order to cope with these requirements, bunch-by-bunch information is required from most of the monitor systems. For precise monitoring of beam position and charge, the Libera Digit 500 instrument was tested as a read-out electronics for BPMs at the existing machine PETRA III. This system features four channels with a 500 MHz sampling rate, synchronized with the accelerator's RF, enabling observation of beam properties with a bunch-by-bunch resolution, thus facilitating a more comprehensive understanding of beam behavior. This contribution provides an overview of the latest beam measurements at the single bunch level, allowing observation of beam oscillations and injection dynamics.

Footnotes

Funding Agency

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Yes

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