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Exploring beam diagnostic performances of cSTART using the KARA booster synchrotron

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cSTART is a future storage ring currently under development at KIT with the purpose to investigate various non-equilibrium beam conditions and the injection and storage of LPA (Laser Plasma Accelerator) like beams. To understand and control the non-equilibrium beam dynamics at cSTART, various beam diagnostics with demanding specifications are required. The KARA booster has been used as an important tool to explore diagnostics for cSTART due to similarities in parameters, in particular the low electron beam energy (50 MeV) and the relatively high revolution frequency. Several beam diagnostics installed in the booster will be also installed in cSTART, i.e. the BPM readout electronics, the Bunch-by-Bunch (BBB) feedback system, the beam loss detection system, etc. In this context, dedicated beam time was used to test the performances of the different beam diagnostics systems, and to prepare for work around solutions in case of limitations if any. In this paper, we will describe the different experiments, emphasizing the procedures and highlighting the applied analysis. Moreover, we will discuss the obtained results and elaborate on their indications for the cSTART performance.

Footnotes

Funding Agency

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Yes

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