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Implementation of tomographic diagnostics at PITZ

The Photo-Injector Test Facility at DESY in Zeuthen, PITZ, is a test bench developing the electron sources capable to drive FELs like FLASH and European XFEL. The characterisation of the source is mainly based on detailed measurements of the transverse phase space at the injector exit. Except for the standard single slit scan technique, in the 2010/2011 run period a module for tomographic diagnostics has been used as an additional device extending the possibilities of PITZ. The module allows measurements of the two transverse planes simultaneously with improved resolution for short pulses and even of single bunches from the bunch train. The major predicaments towards the usage of the module are the conditions PITZ operates with - energies of about 25 MeV, transverse emittance below $1\text{ mm}\cdot\text{mrad}$ for nominal charge of 1 nC , and thus, strong impact of the space-charge forces.

This work presents the first systematic studies done with the module. The measurement procedure is discussed together with experimental results.

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