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Present status of the magnetic bunch compressor at PITZ

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THz free electron laser (FEL) prototype has been developed at the Photo Injector Test Facility at DESY in Zeuthen (PITZ) for obtaining high intensity radiation for THz-pump and X-ray-probe experiments at the European XFEL. In this development, a magnetic bunch compressor (BC) was recently installed in the facility to manipulate the longitudinal properties of the electron bunch, resulting in the enhancement of the THz free-electron laser (FEL) performance. The objective of this study is to explore the electron beam dynamics throughout the magnetic BC using simulated software in order to determine the methodology employed for electron beam commissioning in the experiments. The simulated results have provided a practical method to minimize electron beam dispersion after the BC in the experiment. The method for minimizing dispersion and the commissioning results of the energy measurement of coherent transition radiation (CTR) obtained by applying this method to the magnetic bunch compressor (BC) during the commissioning process are presented in this contribution.

Primary author: KONGMON, Ekkachai (Z_PITZ (Beschleunigerphysik))

Presenter: KONGMON, Ekkachai (Z_PITZ (Beschleunigerphysik))

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