MATTER AND TECHNOLOGIES

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Design of a longitudinal electron diagnostics using THz fields excited in split ring resonator at FLUTE

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Longitudinal electron diagnostics with high temporal resolution is increasingly demanded, especially for free-electron lasers. Strong THz fields, excited in a split ring resonator (SRR), have been recently proposed to streak electron bunches for their temporal characterisation. Thanks to the high amplitude and frequency of the THz field, longitudinal resolution down to the sub-femtosecond range can be expected. A proof-of-principle experiment of the SRR longitudinal diagnostics is planned at the accelerator test facility FLUTE (Ferninfrarot Linac und Test Experiment) at the Karlsruhe Institute of Technology. The design of the experimental chamber has been finished and integrated into the FLUTE accelerator beam line. Beam dynamics simulations have been conducted to investigate and optimise the performance of the SRR diagnostics. In this contribution, we present the design layout of the experimental setup and discuss the simulation results for different parameters of the accelerator and the SRR structure.

Topic (ARD or DTS)

ARD

Primary author: Dr YAN, Minjie (KIT)

Co-authors: Prof. MÜLLER, Anke-Susanne (KIT); Dr SMIT, Bennie (KIT); Dr BRÜNDERMANN, Erik (KIT); Dr SCHEDLER, Manuel (KIT); Dr SCHUH, Marcel (KIT); Dr SCHWARZ, Markus (KIT); Dr DEHLER, Micha (PSI); Dr NASSE, Michael (KIT); HAYATI, Mozhgan (University Bern); Dr HILLER, Nicole (PSI); Dr ISCHEBECK, Rasmus (PSI); Dr RUPRECHT, Robert (KIT); Dr FUNKNER, Stefan (KIT); SCHMELZER, Thiemo (KIT); Prof. FEURER, Thomas (University Bern); Dr SCHLOTT, Volker (PSI)

Presenter: Dr YAN, Minjie (KIT)

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