

GFA & SwissFEL Accelerator Seminar

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

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Longitudinal electron diagnostics with a high time 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. As a collaboration project of the Karlsruhe Institute of Technology (KIT), the Paul Scherrer Institute (PSI) and the University of Bern, a proof-of-principle experiment of the SRR longitudinal diagnostics is planned at the accelerator test facility FLUTE (Ferninfrarot Linac und Test Experiment), which is currently under construction at KIT. 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. Contact: Rasmus Ischebeck

