Nuclear Photonics

Contribution ID: **15** Type: **not specified**

Status of the new Bunch Length Measurement System Downstream of the Injector of the S-DALINAC*

Wednesday, 30 October 2024 11:10 (25 minutes)

Energy-recovery linacs provide high beam currents with lower RF power requirements compared to conventional machines while maintaining the high beam quality of a linac. The S-DALINAC is a thrice-recirculating accelerator operating at a frequency of 3 GHz, that is capable of being operated as a multi-turn superconducting energy-recovery linac. Its efficiency is currently limited by the bunch length, which by now is measured using the RF zero-crossing method. In order to improve both accuracy and measurement time a new setup using a streak camera is developed. Optical transition radiation from electron bunches passing an aluminum-coated Kapton screen is used to produce light pulses that can be measured with the streak camera. An imaging system consisting of multiple mirrors is used to maintain a high temporal resolution for the measurement and to support in shielding the streak camera from harmful radiation. First measurements with the setup were performed downstream of the injector. Preliminary results of the measurements and the design of the setup will be presented.

*Work supported by the State of Hesse within the Research Cluster Project ELEMENTS (Project ID 500/10.006) and by DFG (GRK 2128 AccelencE).

Primary author: BRAUCH, A. (Technische Universität Darmstadt)

Co-authors: SCHNEIDER, D.; SCHLIESSMANN, F.; Prof. ENDERS, J. (Institut für Kernphysik, Fachbereich Physik, Technische Universität Darmstadt, Darmstadt, Germany); JÜRGENSEN, L.; ARNOLD, M.; DUTINE, M.; PIETRALLA, N. (Technische Universität Darmstadt, Department of Physics, Institute for Nuclear Physics, Darmstadt, Germany); GREWE, R.

Presenter: BRAUCH, A. (Technische Universität Darmstadt)

Session Classification: Oral contributions V