

AKBP 1: Electron Accelerators and Sources I

Time: Monday 9:30–10:45

Location: SCH/A117

Topical Talk

AKBP 1.1 Mon 9:30 SCH/A117

Recent Developments at S-DALINAC — ●D. SCHNEIDER, M. ARNOLD, J. BIRKHAN, U. BONNES, A. BRAUCH, L. B. DINGELDEIN, J. ENDERS, R. GREWE, K. IDE, L. JÜRGENSEN, M. MEIER, C. M. NICKEL, N. PIETRALLA, V. PRUY, F. SCHLISSMANN, and T. ZIMMERMANN — Institut für Kernphysik, TU Darmstadt

The superconducting Darmstadt electron linear accelerator S-DALINAC is a thrice-recirculating accelerator [1] which can be operated as an energy recovery linac [2].

Two novel experimental set-ups are being implemented at the S-DALINAC: The study of electron-induced fission reactions of actinides and a demonstrator for Compton backscattering in ERL operation. We have further improved the overall beam quality and the diagnostic capabilities of the accelerator: A streak camera has been implemented for bunch length measurements. Monitoring the beam position with a system of high-speed cameras and a novel feedback-driven beam stabilization, the beam stability was increased significantly. A cavity for a double-chopper setup for the injector has been implemented. This contribution gives an overview on the activities at the S-DALINAC.

[1] N. Pietralla, Nucl. Phys. News, Vol. 28, No. 2, 4 (2018).

[2] F. Schliessmann et al., Nat. Phys. 19, 597-602 (2023).

[3] A. Brauch et al., Rev. Sci. Instrum. 96(11), 113303 (2025).

[4] D. Schneider et al., Nucl. Inst. Phys. A. 1077, 170540 (2025).

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Topical Talk

AKBP 1.2 Mon 10:00 SCH/A117

Status of Source and Delivery of Spin-Polarized Electron Beams at ELSA — ●MICHAEL SWITKA, KLAUS DESCH, DENNIS PROFT, and AXEL SPREITZER — University of Bonn, Physics Institute, Bonn, Germany

Operation of the 50 kV GaAs-based photoinjector source for spin-polarized electrons at the electron stretcher accelerator (ELSA) has been re-established and its usage for regular machine operation is being prepared. This includes the recommissioning of a Compton backscattering polarimeter located in the 3.2 GeV fast ramping storage ring to monitor the effects depolarizing resonances and their countermeasures during the energy increase. An overview of the latest achievements and upcoming improvements is presented.

AKBP 1.3 Mon 10:30 SCH/A117

Simultaneous Beam Extraction at ELSA — ●MAX AMMANN, KLAUS DESCH, DENNIS PROFT, MICHAEL SWITKA, and LEONARDO THOME — Physikalisches Institut der Universität Bonn

At the electron accelerator facility ELSA, electrons with energies up to 3.2 GeV are extracted to multiple experimental stations at two distinct beamlines via slow resonant extraction, serving hadron-physics experiments, detector tests, and medical research. In the past, only one beamline could be served at a time. A new machine-operation mode has been developed that enables extraction to one of the hadron-physics experiments and, simultaneously, to the detector test beamline, where typically lower electron rates are required. This allows more efficient use of the available beam time. The properties and underlying beam dynamics of this machine mode are presented, along with sophisticated methods for rate control at the second beamline.