AKBP 1: Facility Reports

Time: Monday 9:30–11:00 Location: E 020

Group Report AKBP 1.1 Mon 9:30 E 020

KIT accelerators and research highlights - an overview — Bastian Haerer, •Erik Bründermann, Matthias Fuchs, Akira Mochihashi, Markus Schwarz, Julian Gethmann, Johannes L. Steinmann, and Marcel Schuh — Karlsruhe Institute of Technology, Karlsruhe, Germany

The Institute for Beam Physics and Technology (IBPT) at the Karlsruhe Institute of Technology (KIT) operates the Karlsruhe Research Accelerator (KARA) and the short-bunch linear accelerator, Ferninfrarot Linac- und Test-Experiment (FLUTE). In addition, a new compact storage ring will be realised in the context of the cSTART project and a new laser plasma accelerator laboratory will be the stepping stone for R&D based on novel acceleration techniques. This contribution gives an overview of current and future facilities and highlight respective accelerator physics research activities.

Group Report AKBP 1.2 Mon 10:00 E 020

Status of the PITZ facility: photoinjector R&D and applications — •Anne Oppelt — DESY, Platanenallee 6, 15738 Zeuthen

The Photo Injector Test facility at DESY in Zeuthen (PITZ) focuses on the development of high brightness electron sources for Free Electron Lasers (FELs) as well as on the applications of high brightness electron beams. In this talk, we will introduce the PITZ facility with its wide spectrum of beam parameters and its advanced diagnostics capabilities. The latest results of all three research directions will be presented: the development of new L-band normal conducting photocathode RF guns, the worldwide first high-power tunable narrow-band THz SASE FEL, and the new R&D platform FLASHlab@PITZ which offers unique research capabilities for tumor radiotherapy and radiation biology.

Group Report AKBP 1.3 Mon 10:30 E 020

Recent Developments at S-DALINAC* — •Michaela Arnold, Adrian Brauch, Manuel Dutine, Joachim Enders, Ruben Grewe, Lars Jürgensen, Maximilian Meier, Fatemeh Sadat Moujani Ghomi, Norbert Pietralla, Felix Schliessmann, Dominic Schneider, and Alexander Smushkin — Institut für Kernphysik, Technische Universität Darmstadt, Darmstadt, Germany

The superconducting Darmstadt linear accelerator S-DALINAC is a thrice-recirculating accelerator for electrons. Besides the conventional acceleration scheme with corresponding nuclear physics experiments, the accelerator can also be operated as an energy recovery linac (ERL) [1]. Since its establishment in 1991, the S-DALINAC was mainly developed and operated by students. The latest achievement was the successful operation as a superconducting multi-turn ERL [2]. Dedicated diagnostics to measure both beams in the same beamline simultaneously are under commissioning. A streak camera will be used to optimize the bunch length. The operation is supported by machine learning techniques. A laser Compton backscattering setup is close to its commissioning. Other projects are working on further improvements of the machine. This contribution will give a complete overview.

[1] M. Arnold et al., Phys. Rev. Accel. Beams 23, 020101 (2020).

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

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