

DELTA - a university-based synchrotron light source

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DELTA is a 1.5-GeV synchrotron radiation source operated by the TU Dortmund University in Germany. As a university-based facility with emphasis on research and education, it offers a high degree of flexibility for user experiments and a relatively large amount of beamtime for accelerator studies. The beamlines with short-wavelength radiation from a superconducting 7-T wiggler are regularly overbooked. The talk will give an overview of the light source and then concentrate on accelerator physics activities. Since 2011, the interaction of femtosecond laser pulses with the electron beam is being investigated in view of generating ultrashort radiation pulses in the vacuum-ultraviolet regime as well as the coherent emission of terahertz pulses [1]. Recently, an electromagnetic undulator was reconfigured to demonstrate the echo-enabled harmonic generation (EEHG) scheme, where a twofold laser-electron interaction is employed to reach shorter wavelengths [2]. This worldwide first EEHG implementation at a storage ring is not intended to be a user facility but will explore the feasibility and limitations of this novel scheme with a compact setup [3]. Yet another recent activity is the study of synchrotron photons from a single electron in the storage ring.

References

- [1] S. Khan et al., *Synchrotron Radiation News* 24:5, 18 (2011).
- [2] G. Stupakov, *Physical Review Letters* 102, 074801 (2009).
- [3] S. Khan et al., *Proc. of the Int. Part. Accel. Conference, Venice/Italy*, 1057 (2023).