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Updates of the THz SASE FEL at PITZ

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Research and development of an accelerator-based THz source prototype for pump-probe experiments at the European XFEL are ongoing at the Photo Injector Test Facility at DESY in Zeuthen (PITZ). Proof-of-principle experiments have been performed to generate a high-gain THz Free-electron Laser (FEL) based on the Self-Amplified Spontaneous Emission scheme. The first lasing with a central wavelength of 100 μm (3 THz) was observed in the summer of 2022. This contribution presents updates of the THz SASE FEL at PITZ, including recent optimization of beam transport and matching resulting in a measured FEL pulse energy of more than 80 μJ, recent FEL gain curves measurements, and an upgrade plan of THz diagnostics.

Primary authors: BOONPORNPRASERT, Prach (Z_PITZ (Betrieb und Forschung)); KONGMON, Ekkachai (Z_PITZ (Beschleunigerphysik)); KRASILNIKOV, Mikhail (DESY Zeuthen); LI, Xiangkun (DESY Zeuthen)

Presenter: KONGMON, Ekkachai (Z_PITZ (Beschleunigerphysik))

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