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## **S2E Simulation of THz FEL at PITZ with Bunch Compressor**

*Friday 27 June 2025 10:26 (3 minutes)*

The PITZ accelerator comprises a radiofrequency (RF) photogun and an RF booster cavity, capable of generating electron beams with bunch charges of several nC and momenta of up to 22 MeV/c. To achieve higher beam current which is a key parameter for the single-pass high-gain THz FEL, bunch length compression using a four-dipole chicane installed upstream of the undulator has been studied. Using a gaussian photocathode laser, significantly higher beam currents have been obtained, exhibiting flattop profiles with sharp trailing-edge spikes. This poster presents the strong seeding effects from the steep trailing edge of the current profile observed from Genesis simulations. The limited improvement of the radiation energy due to the longitudinal phase space smearing from strong short-range longitudinal space charge forces will also be discussed.

### **Summary**

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