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Terahertz Fringe Fields Effects on the Beam Dynamics of a THz-driven Gun

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The nascent technology of terahertz (THz)-based electron acceleration holds great promise for development of compact relativistic electron sources with femtosecond bunch durations suitable for applications from ultrafast electron diffraction to injectors for THz-based accelerators and light sources. These so-called “THz guns” present unique capabilities, but also unique challenges associated with the small, millimeter-scale of the driving wavelength and the metallic structures. Here we present the results of simulations used to study the effects of fringing fields on the extracted electrons. The THz gun considered is transversely pumped by two single-cycle THz pulses and possesses an interaction length and output orifice of 0.1 mm

Primary authors: KELLERMEIER, Max (DESY); VASHCHENKO, Grygorii (DESY); Dr FAKHARI, Moein (Deutsches Elektronen Synchrotron); MATLIS, Nicholas (DESY (Deutsches Elektronen Synchrotron)); DORDA, Ulrich (DESY); DINTER, Hannes (DESY); Dr FALLAHI, Arya (Deutsches Elektronen Synchrotron (DESY)); ASSMANN, Ralph (DESY); KAERTNER, Franz (DESY, Center for Free-Electron Laser Science, and Universität Hamburg); KROH, Tobias (CFEL (DESY)); Dr ROHWER, Timm (Deutsches Elektronen Synchrotron)

Presenter: KELLERMEIER, Max (DESY)

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