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E-320 at SLAC

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The E-320 collaboration is colliding an electron beam generated at FACET-II with a 10 TW laser pulse [1,2]. In the rest frame of the electron beam, the laser field intensity is comparable to the Schwinger limit, allowing for the study of Strong-Field QED (SFQED). In this regime, quantum corrections to classical synchrotron radiation become important and the probability for electron positron pair production through the decay of emitted gamma photons is not exponentially suppressed [3-5].

In E-320 we are planning to observe the transition from the perturbative to the non-perturbative regime. During this transition qualitative changes to the gamma photon emission spectrum are expected to occur, such as the Compton edges being redshifted significantly and the spectrum becoming quasi-continuous. In this contribution, we discuss the commissioning and planned observations of E-320.

Footnotes

- [1] V. Yakimenko et al., Phys. Rev. Accel. Beams 22, 101301 (2019)
- [2] S. Meuren (for the E-320 collaboration), talk at FACET-II PAC Meeting (2022)
- [3] A. Fedotov et al., Phys. Rep. 1010, 1 (2023)
- [4] A. Gonoskov et al., Rev. Mod. Phys. 94, 045001 (2022)
- [5] A. Di Piazza et al., Rev. Mod. Phys. 84, 1177 (2012)

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