Contribution ID: **84** Type: **Parallel talk**

Strong-field QED measurement tests at FACET-II using new electron detector concept

Tuesday 8 April 2025 14:00 (15 minutes)

Recent advancements in laser technology have made it possible to probe the non-perturbative regime of quantum electrodynamics in strong electromagnetic fields. This regime, also known as strong-field quantum electrodynamics (SFQED), is still largely unexplored. The LUXE experiment planned at DESY will study the transition into the SFQED regime. SFQED interactions, such as non-linear Compton scattering and Breit-Wheeler pair production, will be produced by high-energy electrons interacting with a strong electromagnetic field created by a high-intensity laser. A prototype of the electron detector system, responsible for measuring the electrons that have undergone SFQED interactions at LUXE, was recently set up at the FACET-II beam line at SLAC. The prototype consists of a segmented straw Cherenkov detector, and a scintillator screen and camera set-up. It made its first measurements last November in collaboration with the SFQED experiment E320 at SLAC. This talk will discuss LUXE, the prototype, and the first results obtained from the measurements with E320.

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Session Classification: Detectors and Instrumentation

Track Classification: Detectors and Instrumentation