MATTER AND TECHNOLOGIES

Contribution ID: **116** Type: **Poster without speed talk**

A Cherenkov detector for high-rate electron detection in the LUXE experiment

The Laser Und XFEL Experiment (short LUXE) based at DESY, Hamburg is a
planned experiment to study nonlinearity effects in the strong-field QED regime with high precision.
In order to create electric fields stronger than the so-called Schwinger limit, it is planned to collide a high-intensity laser pulse with either high-energy electrons up to 16.5 GeV or high-energy photons.

As a result, non-linear Compton scattering or Breit-Wheeler interactions will take place, leading to a laser-intensity-dependent shift of the Compton edge and the appearance of higher-order harmonics in the energy spectrum. One of the challenges of measuring the Compton energy spectrum in laser-electron-beam collisions is the expected flux of outgoing Compton-scattered electrons and photons, ranging from 10^3 to 10^{9}$ particles per collision.

This contribution will present the simulation-based design of an electron
flux-resistant Cherenkov detector prototype, first testbeam results as well as optical simulation studies. Further optimisation of the various components as well as reconstruction algorithms will be discussed.

Speed Talks

Normal

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