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Probing for light new particles with the LUXE experiment

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The proposed LUXE experiment (LASER Und XFEL Experiment) at DESY, Hamburg, using the electron beam from the European XFEL, aims to probe QED in the non-perturbative regime created in collisions between high-intensity laser pulses and high-energy electron or photon beams. This setup also provides a unique opportunity to probe physics beyond the standard model. In this talk we show that by leveraging the large photon flux generated at LUXE, one can probe axion-like-particles (ALPs) up to a mass of 350 MeV and with photon coupling of 3×10−6 GeV−1. This reach is comparable to the background-free projection from NA62. In addition, we will discuss the ongoing optimisation of the experimental setup for the ALP search.

Author: HUANG, Shan (IFIC Valencia, Spain)

Co-author: JACOBS, Ruth Magdalena (Deutsches Elektronen-Synchrotron (DE))

Presenter: HUANG, Shan (IFIC Valencia, Spain)

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