

From Theory to Precision Modelling of Strong-Field QED in the Transition Regime

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The combination of energetic electron beams, delivered from conventional accelerators at a high repetition rate and ultraintense lasers, makes it possible to perform precision measurements of strong-field QED. The LUXE collaboration aims to perform precision measurements of nonlinear Compton scattering and Breit-Wheeler pair creation in the transition from the perturbative to nonperturbative regimes [1]. Here we present an overview of recent developments in the modelling of strong-field QED processes, which are needed to reach the required precision of a few per cent for intensity parameters $0.1 < \xi < 10$. We discuss how to go from plane-wave QED results to numerical simulations [2] and present predicted signals and error estimates.

References

- [1] H Abramowicz, U Hernandez Acosta, M Altarelli, *et al.* arXiv:2102.02032 (2020)
- [2] T G Blackburn A J MacLeod and B King, arXiv:2103.06673 (2021)