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## Two-photon production of W-boson pairs at the LHeC and sensitivity to anomalous gauge couplings

We explore the prospects of exclusive  $W^+W^-$  production via photon-photon fusion at the LHeC, operating at a center-of-mass energy of 1.2 TeV [1]. Utilizing the clean experimental environment and high luminosity of the LHeC [2,3], this process could provide a powerful probe of electroweak interactions and possible deviations from SM, particularly through anomalous quartic gauge couplings. We investigate the impact of dimension-8 operators that modify the  $\gamma\gamma W^+W^-$  vertex. Signal sensitivity for semileptonic decay channels of the  $W$  bosons is assessed using Monte Carlo simulations, including detector effects through Delphes. Kinematic distributions and selection strategies are optimized to suppress contributing backgrounds. Finally, a statistical analysis is performed to set 95% CL exclusion limits on aQGC parameters.

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- [1] L. Forthomme, H. Khanpour, K. Piotrkowski, Y. Yamazaki, High energy  $\gamma\gamma$  interactions at the LHeC, paper in preparation.  
[2] F. Ahmadova, K. André, The Large Hadron Electron Collider as a bridge project for CERN, arXiv:2503.17727 [hep-ex].  
[3] P. Agostini, H. Aksakal, et al, The Large Hadron-Electron Collider at the HL-LHC, J. Phys. G 48 (2021) 11, 110501.

### Secondary track

T06 - Top and Electroweak Physics

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