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Radiation Amplitude Zero and Production of Leptoquark at Electron-Proton and Electron-Photon colliders

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Radiation Amplitude Zero (RAZ) is a well-known phenomenon in electroweak sector [1]. The tree-level single photon amplitudes for various electroweak processes vanish at certain regions of phase space depending on the electric charges and four-momenta of the external particles [2]. Using this fact we perform PYTHIA based analyses to probe the signature of leptoquarks [3], which have gained much attention in recent years in explaining flavour anomalies, at ep [4] and $e\gamma$ [5] colliders. While the position of zero in case of ep collider depends only on the charge of leptoquark, the same at $e\gamma$ collider involves the mass of leptoquark and energy of collision too. We find that these two colliders are complementary to each other in a sense that the leptoquarks showing zero at one colliders do not exhibit the null zone at the other one. The effects of non-monochromatic photons at $e\gamma$ collider have also been studied.

References

[1] K. O. Mikaelian, M. A. Samuel and D. Sahdev, Phys. Rev. Lett. 43, 746 (1979), doi:10.1103/PhysRevLett.43.746
[2] S. J. Brodsky and R. W. Brown, Phys. Rev. Lett. 49, 966 (1982), doi:10.1103/PhysRevLett.49.966
[3] I. Doršner, S. Fajfer, A. Greljo, J. F. Kamenik and N. Košnik, Phys. Rept. 641, 1-68 (2016), doi:10.1016/j.physrep.2016.06.001 [arXiv:1603.04993 [hep-ph]].
[4] P. Bandyopadhyay, S. Dutta and A. Karan, Eur. Phys. J. C 81, no.4, 315 (2021), doi:10.1140/epjc/s10052-021-09090-z [arXiv:2012.13644 [hep-ph]].
[5] P. Bandyopadhyay, S. Dutta and A. Karan, Eur. Phys. J. C 80, no.6, 573 (2020), doi:10.1140/epjc/s10052-020-8083-7 [arXiv:2003.11751 [hep-ph]].

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