Contribution ID: **38** Type: **Talk**

Diphoton elastic scattering in UPC at smaller $W_{\gamma\gamma}$

Tuesday, 4 June 2019 10:15 (20 minutes)

So far light-by-light scattering ($\gamma\gamma \to \gamma\gamma$) was not accessible for experiments because the corresponding cross section is rather low. Measurements of diphotons in ultra-peripheral collisions (UPCs) of lead-lead have been reported recently by the ATLAS [1] and CMS Collaborations [2]. Our theoretical results based on equivalent photon approximation in the impact parameter space [3] are in agreement with the current data [1, 2].
We will discuss how to extend such studies to lower $\gamma\gamma$ energies where photoproduction of pseudoscalar and scalar resonances contribute to the two-photon final state. In addition, we consider the dominant background that arises from $\gamma\gamma$ fusion into pairs of neutral pions [4]. Such π^0-pairs contribute to the background when only two of the four decay photons are within the experimental acceptance, the other two photons escape undetected. We will discuss in detail how to reduce the unwanted background. We will present differential distributions and total cross section in ultra-peripheral Pb-Pb collisions at $\sqrt{s_{NN}} = 5.05$ and 5.52 TeV [5] and cross section for Ar-Ar collisions at the energy equal to 6.3 TeV [6]. Results for ALICE and LHCb acceptance will be presented.

[1] ATLAS Collaboration, Nature Phys. 13 (2017) 852 & arXiv:1904.03536 [hep-ex]
[2] CMS Collaboration, arXiv:1810.04602
[3] M.Kłusek-Gawenda, P.Lebiedowicz, A.Szczurek, Phys. Rev. **C93** (2016) 044907
[4] M.Kłusek-Gawenda, A.Szczurek, Phys. Rev. **C87** (2013) 054908
[5] M.Kłusek-Gawenda, R.McNulty, R.Schicker, A.Szczurek, 1904.01243 [hep-ph]
[6] Z.Citron et al., arXiv:1812.06772

Summary

Primary authors: KLUSEK-GAWENDA, Mariola (Institute of Nuclear Physics Polish Academy of Sciences); SZCZUREK, Antoni (Institute of Nuclear Physics, Krakow and Rzeszow University, Rzeszow)

Presenter: SZCZUREK, Antoni (Institute of Nuclear Physics, Krakow and Rzeszow University, Rzeszow)

Session Classification: Gamma-Gamma Collisions

Track Classification: Gamma-Gamma Collisions