

The Role of Mesons in Light-by-Light Scattering at Low Transverse Momentum

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Light-by-Light scattering involves the interaction of two strong electromagnetic fields, resulting in the emission of two photons. The phenomenon was first observed experimentally in 2017 [1][2], using photon measurements in ultraperipheral lead-lead collisions (UPC). Applying the Equivalent Photon Approximation model gives results which describe differential and total cross sections presented by ATLAS and CMS Collaborations [3]. They have detected photons in midrapidity for $p_t > 2.5$ (ATLAS) and $p_t > 2$ GeV (CMS).

In the next few years, the ALICE 3 experiment [4] is going to measure photons in forward calorimeter (FoCal) [5], in the transverse momentum range $p_t = 1 - 50$ MeV and $100 - 5000$ MeV, which have not been investigated so far. Moving to a lower range of p_t imposes a consideration of low-energy meson resonances which decay into two-photon channel. The first contribution from η, η' mesons in UPC was studied in [6]. Research in the low p_t area allows to verify the importance of pion. Furthermore, experimental possibilities to investigate the VDM-Regge mechanism [7] will be discussed. The role of the vertical background in light-by-light scattering measurements will also be shown.

Bibliography:

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