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Tale of coherent photon products: from UPC to HHIC

Summary

The coherent photon-nucleus and photon-photon interactions has been studied in detail to probe the gluon distribution in nucleus and to test QED via relativistic heavy-ion collisions. These kind of interactions are traditionally thought to be only exist in ultra-peripheral collisions (UPC), where there is no hadronic interactions. Recently, significant excess of J/ψ yield and dielectron pair production at very low transverse momentum ($p_T < 0.3$ GeV/c) were observed by the ALICE and STAR collaborations in peripheral A+A collisions, which points to evidence of coherent photon products in hadronic heavy-ion collisions (HHIC). The possible survival of photoproduced J/ψ and electron pair stimulates further experimental and theoretical investigations.

In this talk, I will review on the recent experimental and theoretical progress on the coherent photon induced reactions from UPC to HHIC.

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