Lepton Pair Production via Two-Photon Process in UPC at STAR

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Relativistic ultra-peripheral heavy-ion collisions (UPCs) generate an extremely intense electromagnetic field, offering an ideal setting for investigating the electromagnetic excitation of the vacuum. The lowest-order QED excitation involves the creation of lepton pairs through two-photon fusion, commonly referred to as the Breit-Wheeler (BW). In this presentation, we will report a comprehensive study of BW process in UPCs conducted at STAR for Au+Au collisions at $\sqrt{s_{NN}} =$ 200 GeV. We will present the total production rate, differential pair mass, and transverse momentum distributions as indicators of the characteristics of lepton pairs from BW process in heavy-ion collisions. Furthermore, we will also discuss the angular modulation of the process which provides insights into the behavior of the interacting photons, elucidating their resemblance to real photons with transverse linear polarization.