

Measurements of photon-induced J/ψ azimuthal anisotropy in isobar collisions at STAR

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Abstract

1 Ultra-strong electromagnetic field in relativistic heavy-ion collisions could be
2 quantized as a large flux of linearly polarized quasi-real photons. These photons
3 can interact with nuclei or nucleons, leading to vector meson production ($\gamma + A \rightarrow$
4 $V + A$). Notably, azimuthal asymmetries between the pair momentum and the
5 daughter momentum could arise from the linear polarization of incident photons
6 correlated with spin interference effect. On the other hand, the decay daughters
7 of these vector mesons inherit polarization information of the photons, which is
8 related to the initial collision geometry. Thus, the measurement of azimuthal
9 anisotropy of these decay daughters offers a novel and direct probe into both the
10 initial collision geometry and the polarization characteristics of the photons.

11 In this presentation, we will report the angular modulation measurements of
12 the photon-induced J/ψ pair production in Ru+Ru and Zr+Zr ultra peripheral
13 collisions at $\sqrt{s_{NN}} = 200$ GeV. Additionally, we will also present the measure-
14 ments of the azimuthal anisotropy with respect to the event plane (v_2) of electrons
15 decayed from photon-induced J/ψ in non-central collisions from the same collision
16 systems. Our results offer novel insights into both the collision geometry and spin
17 interference effect.