## Measurements of photon-induced $J/\psi$ azimuthal anisotropy in isobar collisions at STAR

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## Abstract

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

In this presentation, we will report the angular modulation measurements of the photon-induced  $J/\psi$  production in Ru+Ru and Zr+Zr ultra peripheral collisions at  $\sqrt{s_{NN}} = 200$  GeV. Additionally, we will also present a measurements of the azimuthal anisotropy of electrons decayed from photon-induced  $J/\psi$  with respect to the event plane in non-central collisions from the same collision systems. Physics implications of these results will be discussed together with model comparisons.