

Initial electromagnetic field dependence of photon-induced production in isobaric collisions at STAR

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Abstract

1 The Lorentz-boosted electromagnetic field, arising from a colliding nucleus, can
2 be treated as a flux of quasi-real photons. Consequent photonuclear ($\propto Z^2$) and
3 photon-photon ($\propto Z^4$) processes could reasonably explain the observed enhance-
4 ments of J/ψ and e^+e^- pair production at very low transverse momenta (p_T)
5 in peripheral heavy-ion collisions. The STAR experiment collected datasets of
6 $^{96}_{44}\text{Ru}+^{96}_{44}\text{Ru}$ and $^{96}_{40}\text{Zr}+^{96}_{40}\text{Zr}$ collisions at 200 GeV in 2018, which provide a unique
7 opportunity to study photon-induced processes.

8 In this presentation, we will compare measurements of J/ψ and e^+e^- pair pro-
9 duction at very low p_T in isobaric and Au+Au collisions to study their electro-
10 magnetic field dependence. The angular modulation of dielectron pairs will also
11 be presented. Physics implications of these results will be discussed together with
12 model comparisons.