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## Measurement of $J/\psi$ polarization in Ru+Ru and Zr+Zr collisions at $\sqrt{s_{NN}} = 200$ GeV at STAR

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$J/\psi$  serves as an important probe to study the properties of the quark-gluon plasma (QGP) created in heavy-ion collisions. In Ru+Ru and Zr+Zr collisions at  $\sqrt{s_{NN}} = 200$  GeV, it has been observed that the  $J/\psi$  yield is strongly suppressed and its elliptic flow ( $v_2$ ) is consistent with zero, indicating  $J/\psi$ 's strong coupling with the medium and its potentially small regeneration contribution. Besides those measurements, the  $J/\psi$  polarization can shed new light on the QGP properties and the  $J/\psi$  production mechanism in heavy-ion collisions. For example, it has been hypothesized that  $J/\psi$  can be polarized due to the spin-orbit coupling between  $J/\psi$  and QGP's large angular momentum in non-central heavy-ion collisions. The early production of  $J/\psi$  also makes its polarization potentially sensitive to the strong magnetic field at the early stage. In this poster, we will present the first measurement of  $J/\psi$  polarization in heavy-ion collisions at RHIC. The  $J/\psi$  polarization in the Helicity frame and Collins-Soper frame, as well as with respect to the event-plane, in Ru+Ru and Zr+Zr collisions at  $\sqrt{s_{NN}} = 200$  GeV will be presented, and its physics implications will be discussed.

### Category

Experiment

### Collaboration (if applicable)

The STAR Collaboration

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