Semi-inclusive hadron+jet and inclusive jet yield measurements in O+O collisions at $\sqrt{s_{NN}}$= 200 GeV at STAR

Sijie Zhang for the STAR Collaboration
Shandong University

Jet quenching, a key probe for studying the properties of the Quark Gluon Plasma (QGP) formed in heavy-ion collisions, involves modifications to the energy and substructure of high-energy parton showers within the QGP. While the jet quenching phenomenon has been well established in large collision systems, such as Au+Au and Pb+Pb collisions, it is not observed in smaller p+A collisions, either because the medium is not formed, or its temperature or lifetime is too low to cause jets to lose much energy. This highlights the need for studying the system size dependence of the jet quenching phenomenon, and O+O collisions provide a great opportunity for such studies as they bridge the gap between these small and large systems. We present the first measurement of jet yield in O+O collisions at $\sqrt{s_{NN}}$= 200 GeV, utilizing both inclusive jet and semi-inclusive hadron+jet, including results for different centralities with jet R from 0.2 to 0.5. For semi-inclusive measurement, we select recoil jets with a high-p_T trigger hadron in the range of p_T = 7 – 30 GeV. Mixed event technique is used to correct for the uncorrelation background contribution in heavy-ion collisions. These results are compared to similar measurements in collision systems of various sizes, providing valuable insight into how the system size affects the QGP properties.