System size dependence of high p_{T} hadron yield modification in the Quark-Gluon Plasma with $\sqrt{s_{\mathrm{NN}}}$ = 200 GeV isobar collisions at STAR

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While traversing the Quark-Gluon Plasma (QGP) produced in relativistic heavy-ion collisions, high energy partons lose energy to the medium, and hence provide information about transport properties of the QGP. A common proxy to these partons is the high transverse momentum (p_{T}) particles they hadronize into. Quenching effects of high p_{T} partons can be quantified via the nuclear modification factor (R_{AA}) relative to $p+p$ collisions. While previous studies focus more on the collision energy dependence of the modification, we present results that study its dependence on the size of the collision system.

We will present differential measurements of high p_{T} charged hadrons and their R_{AA} using the large isobar (Ru+Ru and Zr+Zr) dataset, with $\sim$2 billion events per species, collected with the STAR detector in 2018. Different centralities of the isobar collisions provide a unique coverage of the number of participants from a few to a couple hundred. Combining the isobar results with previous measurements in d+Au, Cu+Cu, and Au+Au collisions, we will discuss the dependence of high p_{T} hadron R_{AA} on system size. We will also report the observation of geometry and selection bias to R_{AA} in peripheral isobar events, and discuss possible methods to account for this bias.