Contribution ID: **373** Type: **Invited Talk for Parallel Sessions (Invitation Only)**

Comparisons and Predictions for Collisions of deformed 238U nuclei at $\sqrt{s_{NN}} = 193$ GeV

Tuesday, 27 May 2025 08:30 (25 minutes)

Relativistic heavy ion collisions provide exciting new ways to probe nuclear structures. In this talk, we present model-to-data comparisons for the collisions of very-deformed nuclei (U+U collisions at $\sqrt{s_{NN}} = 193$ GeV) and slightly-deformed nuclei (Au+Au collisions at $\sqrt{s_{NN}} = 200$ GeV) at RHIC. For theoretical calculations, we use a multistage model consisting of boost-invariant IP-Glasma initial state, MUSIC hydrodynamics, and a hadronic transport cascade generated by iS3D & SMASH. Two different Woods-Saxon parametrizations per U and Au are used, allowing for comparisons within our model. In doing so, we achieve a consistent description of existing bulk and flow measurements favouring more modern parameter sets. We also present our prediction for the $v_2 - p_T$ correlation [arXiv:2308.09816], which were later found to match very well the experimental result by STAR [arXiv:2401.06625], thus demonstrating that momentum-flow correlations are sensitive probes of nuclear deformation. We will also report on the fitted values of the xenon deformation parameters through our (3+1)D calculations of Xe+Xe collisions at $\sqrt{s_{NN}} = 5.44$ TeV.

Primary authors: Prof. GALE, Charles (McGill University); Dr FORTIER, Nicolas (McGill University); JEON, Sangyong (McGill University)

Presenter: JEON, Sangyong (McGill University)

Session Classification: Parallel Session

Track Classification: Hot and Dense Nuclear Matter