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Modeling Initial Conditions in Light-Ion Collisions KEVIN WELSH, JORDAN SINGER, BRIAN BAKER, Ohio State Univ - Columbus — When particles collide at relativistic speeds, they generate an exotic form of matter called quark gluon plasma. Currently, the only way to observe this type of matter in nuclear collisions is at particle accelerators, such as the Relativistic Heavy Ion Collider. The relative initial position and orientation of the colliding nuclei has a large influence on the anisotropies found in the plasma that evolves from it, and the initial orientation depends on everything from the energy of the nuclei to the internal structure of their nucleons, and there are aspects of the plasma evolution that remain undetermined. In order to improve the modeling of high energy particle collisions I study proton-gold collisions where previous evolution models fail to quantitatively describe the observed flow pattern. I have added sub-nucleonic structure and gluon field fluctuations to the energy density profiles created in nuclear collisions that we hope improves the description of light-heavy collisions. I show the effects of these fluctuations on the initial eccentricities that drive anisotropic flow of the QGP. I found increased ellipticity and triangularity which offer the chance to better reproduce the experimentally measured large elliptic and triangular flows seen in p+Pb collisions at the LHC.

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