Identified hadron spectra and baryon stopping in $\gamma + \mathrm{Au}$ collisions at STAR

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Photonuclear collisions are one of the simplest processes that can happen in a heavy-ion collision. They occur when one nucleus emits a quasi-real photon which interacts with the other colliding nucleus, similar to an $e + A$ collision except that the photon tends to have a much smaller virtuality. Photonuclear collisions can be used to study bulk properties of the medium such as collectivity due to initial-state effects and hadron chemistry. Results are presented for identified $\pi^{\pm}$, $K^{\pm}$, and $p(\bar{p})$ spectra in photonuclear collisions at STAR for Au+Au collisions at $\sqrt{s_{NN}} = 54.4$ GeV. Significant baryon stopping and rapidity asymmetry is observed at low transverse momentum, which could indicate the existence of a baryon junction within the nucleon, a nonperturbative Y-shaped configuration of gluons which carries the baryon number and is attached to all three valence quarks. Measuring the same spectra using the 2019 Au+Au dataset at $\sqrt{s_{NN}} = 200$ GeV shows how these effects change as a function of beam energy. Measurements of particle spectra and their rapidity dependence in photonuclear events will give insight into the origin of small-system collectivity, the gluon structure of the nucleon and will help inform future measurements using particle identification at the Electron Ion Collider.