

Abstract Submitted
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Collisional Energy Loss of Energetic Particles MARGARET STEWART, Purdue University — RHIC has collided gold nuclei at 200 GeV per nucleon-nucleon pair. Upon a head-on collision about 10,000 particles are produced, a small fraction of them is energetic. However, experiments at RHIC have observed fewer energetic particles than expected from theory. This led to the conclusion that a new state of matter, possibly a quark-gluon plasma (QGP), is created in those collisions. When this hot and dense matter expands and cools down clustering into hadrons, the hadrons that are still energetic collide elastically and lose energy before reaching the detector. We have created a computer program that uses several physical concepts to simulate collisions between an incident energetic particle and hadrons in a thermal bath. This allows us to study the probability distributions of both the scattering angle and the energy of the incident particle after several collisions. That way, we will gain an understanding of the degree of collisional energy loss due to the late stage of hadron-hadron collisions, thereby quantifying the early stage energy loss of energetic particles in the created matter, which will give us a better understanding of the early universe.

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