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Modification of jets travelling through a brick-like medium

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The present work addresses the puzzle related to the observation of collective flow in collisions of small systems (which indicates the presence of a medium even in such collisions) and the absence of jet quenching in such systems (which would not be expected if jets are traversing a medium). This study has been done using the JEWEL event generator with a "brick"-like medium. This simplified medium is made up of a collection of gluons at a given temperature and density distributed in an elliptical or spherical volume. A pair of jets is then created in the center of this medium and, as the jets evolve, the number of jet-medium interactions is counted. This way, we were able to study how R_{AA} and v_2 vary with the number of jet-medium interactions independently from any models for medium expansion and evolution.

What we have found is that, for different eccentricities of an ellipsoidal medium, a v_2 signal can be obtained with a smaller number of jet-medium interactions than are necessary to obtain a signal in R_{AA}. This indicates that, if there is a medium being created in collisions of small systems, it is possible that the volume of such a medium is large enough for the creation of collective flow but not large enough to give rise to an R_{AA} signal. A paper containing these results is in preparation and will soon be published on Arxiv and submitted to a journal for peer review.

Category

Theory

Collaboration

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