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Studies of the difference between light and heavy flavor energy loss by reconstructed jets

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While the nuclear modification factor $R_{\rm AA}$ of charged hadrons measures jet quenching in terms of the suppression of single inclusive particle spectra, studies employing reconstructed jets additionally allow the investigation of medium modifications to the initial parton shower as a whole and thereby provide information about the angular dependence of jet quenching. Furthermore, due to mass effects the energy loss of jets is expected to be sensitive to the flavor of the shower-initiating parton. For investigating the medium modification of parton showers, we employ the transport approach BAMPS, which numerically solves the (3+1)D Boltzmann equation for gluons, light and heavy quarks based on pQCD cross sections for both $2\rightarrow2$ and $2\leftrightarrow3$ processes. While employing an improved Gunion-Bertsch matrix element together with a running coupling, BAMPS simulations show a good agreement with data for both $R_{\rm AA}$ and the elliptic flow v_2. We present recent results about the $R_{\rm AA}$ of inclusive and b-tagged reconstructed jets and the modification of the underlying jet shapes. We show that the suppression of b-tagged jets is dominated by elastic energy loss of the bottom quark, while radiative processes of gluons and light quarks additionally broaden the distribution of momentum within the inclusive jets.

Summary

Presentation type

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