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Probing parton formation times with $g \rightarrow c\bar{c}$ splitting

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In vacuum, the spacetime location where a gluon splits into a quark-antiquark pair is not a well defined observable. In heavy-ion collisions, the ‘formation time’ of a splitting takes on meaning due to interactions with the medium and is a critical feature for the phenomenology of medium-modified parton showers. The $g \rightarrow c\bar{c}$ splitting is especially suited to study this formation time, as the $c\bar{c}$ virtuality is of the same order as medium effects and since the typical time is of the same order as the quark-gluon plasma lifetime. In this talk we demonstrate how to study this process from hadron distributions inside jets containing two D mesons. In particular, we show how the virtuality distribution of the original splitting depends characteristically on the formation time.

Category

Theory

Collaboration (if applicable)

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