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Medium-enhanced Production of C-cbar Pairs in Jets

The degrees of freedom of the high temperature phase of QCD matter produced in heavy-ion collisions can be studied through its interactions with high-energy partons that are also produced in these collisions. The medium broadens the momentum and degrades the energy of these partons, which is observed as a suppression of the yield of high-energy jets and hadrons in heavy-ion collisions compared to a proton-proton baseline.

These interactions can be characterized by medium-modification of the QCD splitting functions. We study the modification of the $g \rightarrow c\bar{c}$ splitting function in the kinematic range accessible at the LHC. In addition to characterizing the momentum broadening of the $c\bar{c}$ pair, we find that interactions with the medium also enhance the rate of $c\bar{c}$ production. We also propose an experimental signature of this enhancement through the rate of jets containing two D_0 mesons in heavy-ion collisions.

**Tuesday, 05 July 2022,
14:15 in D6-135
www.physik.uni-bielefeld.de**