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Search for gluon saturation at small Bjorken-x with the LHCb detector

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A new state of matter, where gluons have overlapping wave functions, has been in the minds of particle and nuclear physicists for decades. This gluon saturated state could explain several recent observations such as particle production and collectivity observed in p+p, p+A and A+A collisions at RHIC and LHC.

The LHCb experiment is a forward spectrometer with vertexing, tracking, p, K, pi, e, μ identification and calorimetry in the pseudorapidity region $2 < \eta < 5$. LHCb is therefore well suited to study the gluon density of hadrons in at small Bjorken-x values ($x \sim 10^{-6} - 10^{-5}$), down to two orders of magnitude smaller than HERA.

The status of the analysis efforts aimed at finding the gluon saturation scale at LHCb using isolated photon yields and their correlations with hadrons and jets will be shown. In addition, the concept and R&D efforts of a new particle tracker inside the LHCb magnet to improve measurements of small Q^2 processes, where gluon saturation is expected, will be presented.

Content type

Experiment

Collaboration

LHCb

Centralised submission by Collaboration

Presenter name already specified

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