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Review of some recent phenomenological results of the impact of the intrinsic charm (heavy quark) mechanism on the charm production

The observation of a double charm baryon provided by the SELEX experiment and the NA3 results on $\pi A \rightarrow J/\psi J/\psi X$ at a large mean value for x_F are usually used to show an evidence for the intrinsic charm mechanism. In the past two years the LHCb collaboration provided a high statistics observation of double charm baryons.

However, the mass difference between the SELEX and the LHCb candidates was $103 \text{ MeV}/c^2$. These states cannot be readily interpreted as an isospin doublet since one would expect a mass difference of isospin partners to differ by only a few MeV/c^2 .

In this talk we show that the intrinsic charm mechanism for the hadroproduction of heavy hadrons at large x_F can resolve the apparent conflict between measurements of double-charm baryons by the SELEX fixed-target experiment and the LHCb experiment. We show that in fact both experiments are compatible, and that both can be correct. The observed spectroscopy is in agreement with the predictions of supersymmetric light front holographic QCD.

However, we also show that the NA3 measurements on the production of pairs of J/ψ mesons are puzzling and do not allow for a simple interpretation. Finally, the perspectives of the COMPASS experiment on the clarification of the NA3 result will be discussed, as well as opportunities for the observation of signals of the intrinsic charm mechanism at the LHCb detector, where we concentrate on the kinematic of charm production from the target.

Choix de session parallèle

1.3 Physique nucléaire: physique hadronique et QCD

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