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Particle Physics at LPTHE

Mardi 5 Novembre 2024, 14 :00
LPTHE, library
Domaines : hep-ph

Titre : *Exploring Quarkonium physics at small transverse momentum*

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Résumé : *Despite more than 50 years of research on protons and their partonic constituents, the complete picture is still obscure, especially if one includes polarisation and transverse momentum effects. While recent works have performed direct extractions of quark transverse momentum dependent distributions (TMD) of protons, the same knowledge about gluon distributions lags behind. Thus, it is crucial to identify observables that are sensitive to gluons. Accordingly, quarkonia are key tools to access gluon TMDs, allowing us to explore lower energy scales as compared, for instance, to Higgs production. However, doubts persist on the correct underlying formation mechanism of quarkonia, and the formalism to accurately describe their production at small transverse momentum. In this talk I will present some recent works published in the 2020s. The first part focuses on the opportunities and challenges of using the non-relativistic QCD (NRQCD) approach to describe quarkonium production at small transverse momentum. In the second part, I will discuss observables measurable at either the future Electron-Ion Collider or the LHC that can help shed light on the gluon content of protons.*