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Accessing gluon TMDs through J/psi-pair production

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J/ψ-pair production at the LHC is currently the most promising tool to probe the unknown *gluon* transverse momentum distributions (TMDs). Data from LHCb at low transverse momenta are already available and more are expected soon from CMS and LHCb. Such data in the collider mode should soon allow one to probe the evolution of the unpolarised-gluon TMDs and to measure, for the first time, the distribution of the linearly polarised gluon in unpolarised protons. In addition, data in the fixed-target mode will give us some handle to measure the momentum-fraction dependence of the TMDs.

In this talk, I will revise previous results obtained for the collider mode and present first results for the fixed-target mode. After showing a comparison with the existing LHCb data, I will discuss predictions of transverse-momentum distributions at different invariant masses that could be measured by LHCb and CMS in the collider mode. I will then present predictions for azimuthal modulations of the cross section that arise from linearly polarised gluons.

I will show that the azimuthal modulations are reduced when the momentum fractions of the two colliding gluons are different, $x_1 \neq x_2$. In general, the azimuthal modulations are found significantly larger for $x_1 = x_2$, which is then likely the most favourable region to set constraints on the linearly polarised gluon TMDs.

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