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Double parton scattering and 3D proton structure: a light-front analysis

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We present a calculation of the effective cross section σ_{eff} , an important ingredient in the theoretical description of double parton scattering in proton-proton collisions. The theoretical approach makes use of a Light-Front quark model as framework to calculate the double parton distribution functions at low-resolution scale. QCD evolution is implemented to reach the experimental resolution scale. The obtained σ_{eff} , when averaged over the longitudinal momentum fractions of the interacting partons, x_i in the valence region, is consistent with the present experimental scenario. However the complete result shows a strong dependence of σ_{eff} on x_i , a feature not easily seen in the available data, probably because of their low accuracy. Measurements of σ_{eff} in restricted x_i regions are addressed to obtain a first indication of double parton correlations, a novel and interesting aspect of the three dimensional structure of the nucleon.

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