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Double parton distributions and heavy-quark mass effects

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Double parton distributions (DPDs) are an essential ingredient in the computation of the full DPS cross sections. Their numerical handling is complicated by their structure, which depends on more than twice the number of parameters with respect to regular PDFs. Furthermore, in order to make phenomenological predictions for DPS, it is necessary to also include heavy-quark contributions in the calculations, and in some cases the effects of their masses.

We developed a library called ChiliPDF, which is able to perform the interpolation and evolution of single and double parton distributions with arbitrary input and in a precise and efficient way. Using this library, we produce for the first time evolved DPDs using NNLO DGLAP evolution and matching at the flavor transition scales. We also present some studies and developments regarding the effect of the heavy-quark masses on DPDs, specifically in the case of perturbative splitting from regular PDFs, which happens in the limit of small interpartonic transverse distance.

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