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Double Parton Distributions of the Pion

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The effects of double hard interactions are no longer negligible at energy scales reached at the LHC. Double parton scattering (DPS) processes are often described by taking the product of two single parton scattering processes assuming that interference effects are very small. We calculate four point functions (4pt-functions), which appear in the the DPS cross section, employing lattice techniques. We consider a pion at rest and test the validity of the afore-mentioned factorization assumption by convoluting two pion form factors and comparing the result to the 4pt data. For our calculations we use a $N_f = 2$ gauge ensemble on a $40^3 \times 64$ lattice, with lattice spacing $a = 0.071\text{fm}$ and pion mass $m_\pi = 288.8\text{MeV}$.

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