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Parton Distribution Function of a Deuteron-like Dibaryon System from Lattice QCD

We report a lattice QCD calculation of the parton distribution function (PDF) of a deuteron-like dibaryon system using large-momentum effective theory (LaMET). The calculation is done on three Wilson Clover ensembles with a fixed lattice spacing $a = 0.105$˜fm and two pion masses. The lattice matrix elements are computed at proton momenta up to 2.46˜GeV with the signal of high momentum modes being improved by applying the momentum smearing technique. The state-of-the-art renormalization, matching and extrapolation are then applied to obtain the final result of the light-cone PDF. A comparison between the result of the dibaryon system and the sum of the proton and neutron PDFs is also given.

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