

Heavy Quarkonium in a Light-Front Holographic Basis

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Abstract

We study the heavy quarkonium within the basis light-front quantization approach. We implement the one-gluon exchange interaction and a confining potential inspired by light-front holography. We adopt the holographic light-front wavefunction (LFWF) as our basis function and solve the non-perturbative dynamics by diagonalizing the Hamiltonian matrix. We obtain the mass spectrum for charmonium and bottomonium. With the obtained LFWFs, we also compute the decay constants and the charge form factors, GPDs for selected eigenstates. The results are compared with the experimental measurements and with other established methods. Finally, we also discuss the application to diffractive vector meson photo-production in deep inelastic scattering (DIS).

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