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The D-term of the proton with basis light-front quantization

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We compute the gravitational form factors (GFFs) and study their applications for the description of the mechanical properties such as the pressure, shear force distributions, and the mechanical radius of the proton from its light-front wave functions (LFWFs) based on basis light-front quantization (BLFQ). We find acceptable agreement between our BLFQ computations and the lattice QCD for the GFFs. Our D-term form factor also agrees well with the extracted data from the deeply virtual Compton scattering experiments at Jefferson Lab, and the results of different phenomenological models. The distributions of pressures and shear forces are similar to those from different models.

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