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Mechanical properties of proton from its energy-momentum tensor

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The discovery of the relation between the quantum energy-momentum tensor (EMT) and General Parton Distributions [1, 2] provides a unique way to study the EMT of the nucleon [3,4].

It was shown that the expectation value of the EMT for an unpolarized proton target in the Breit frame has the same structure as that of an anisotropic perfect fluid density [5,6]. Thus, in this case one can identify terms related to the internal energy and transverse/radial pressure inside a proton. We illustrate these results using current phenomenological knowledge of the EMT form factors.

References

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