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hadronic tensor in (1+1)-dimensional systems by quantum computing

The hadronic tensor encodes key information about the internal structure of hadrons, reflecting the non-perturbative features of quantum chromodynamics (QCD). We perform a direct computation of the hadronic tensor in (1+1)-dimensional $U(1)$ and $SU(2)$ gauge theories by evaluating the real-time current-current correlation function using proposed quantum algorithms implemented on classical hardware. We demonstrate that the elastic form factor can be reliably extracted from the hadronic tensor, with results showing good agreement with those obtained via exact diagonalization.

Primary authors: ZOU, Dairui (South China Normal Universi); LI, Tianyin (South China Normal University); XING, Hongxi (South China Normal University)

Presenter: ZOU, Dairui (South China Normal Universi)