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Glue Helicity ΔG In the Nucleon

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We present a lattice QCD calculation of the glue helicity ΔG in the nucleon for the first time.
It is recently shown that the first moment of the glue helicity distribution can be obtained through the product of the the electric field $\vec{E}$ and the gauge field in the Coulomb gauge $\vec{A}_C$, i.e.
$\vec{E} \times \vec{A}_C$ in the infinite momentum frame. We used the gauge field tensor from the overlap Dirac operator to check the frame dependence with several momenta. The calculation is carried out with valence overlap fermion on 2+1 flavor DWF gauge configurations on the $24^3 \times 64$ lattice with the light sea quark mass corresponds to a pion mass of 330 MeV.

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