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Magnetic polarizability of a charged pion from four-point functions

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We explore a general method based on four-point functions in lattice QCD. The electric polarizability (α_E) of a charged pion has been determined from the method in a previous simulation. Here we focus on the magnetic polarizability (β_M) using the same quenched Wilson action on a $24^3 \times 48$ lattice at $\beta = 6.0$ with pion mass from 1100 to 370 MeV. The results from the connected diagrams show a large cancellation between the elastic and inelastic contributions, leading to a relatively small and negative value for β_M consistent with chiral perturbation theory.

Topical area

Structure of Hadrons and Nuclei

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