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Quark exchange and the expansion of length scales inside nuclei

Pervez Hoodbhoy
Department of Physics, Quaid-e-Azam University, Islamabad, Pakistan

Abstract

Fermi statistics requires that all quarks in a nucleus be antisymmetrized, and hence that quarks belonging to different nucleons be exchanged in proportion to the degree of nucleon overlap. It is shown here that this leads to: (1) a shift in the distribution of quark momentum relative to that in isolated nucleons, and, (2) an additional contribution to the quark-quark correlation beyond that normally expected.

Keywords

Quark Exchange; EMC Effect; Quark Correlation; Nucleon Size Change; Rescaling; Quark Clusters

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