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Proton Spin in Deep Inelastic Scattering

So far the analysis of the polarized structure functions have been limited to
the evaluation of their integrals and comparing them to the prediction of the
static quark model of the nucleon given by Ellis and Jaffe. We extended our analysis
to the x dependence of the polarized structure functions and observe:
the measured structure function excellently agrees with the prediction of the
static quark model for
Bjorken $x > 0.1$
and drops rapidly for $x < 0.1$. It is suggested that for Bjorken $x > 0.1$ electrons
get scattered on the undamaged constituent quarks (alias valence quarks)–quasi elastic scattering on the
constituent quarks–and for $x < 0.1$ the
constituent quarks fragment. In the fragmentation strong interaction is involved which
does not preserve the polarization.

About 50\% of the constituent quarks survive the collision with electrons at $Q^2 \sim 2$ GeV^2 undamaged
what implies that the constituent quark is a rather strongly bound rigid object. The polarization
measurements of the quarks of the nucleon strongly supports the constituent quark as the step
in the ladder between the sea quark and the nucleon. The low x physics is the only way to
study the structure of the constituent quarks.

Primary author: POVH, Bogdan (MPIK Heidelberg)

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