High Energy Physics - Experiment

The Spin-dependent Structure Function of the Proton g_1^p and a Test of the Bjorken Sum Rule

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(Submitted on 26 Jan 2010)

The inclusive double-spin asymmetry, A_1^p, has been measured at COMPASS in deepinelastic polarised muon scattering off a large polarised NH3 target. The data, collected in the year 2007, cover the range Q2 > 1 (GeV/c)^2, 0.004 < x < 0.7 and improve the statistical precision of g_1^p(x) by a factor of two in the region x < 0.02. The new proton asymmetries are combined with those previously published for the deuteron to extract the non-singlet spin-dependent structure function g_1^NS(x,Q2). The isovector quark density, Delta_q_3(x,Q2), is evaluated from a NLO QCD fit of g_1^NS. The first moment of Delta_q3 is in good agreement with the value predicted by the Bjorken sum rule and corresponds to a ratio of the axial and vector coupling constants g_A/g_V = 1.28+-0.07(stat)+-0.10(syst).

Comments:	12 pages, 5 figures
Subjects:	**High Energy Physics - Experiment (hep-ex)**
Report number:	CERN-PH-EP/2010-001
Cite as:	**arXiv:1001.4654v1 [hep-ex]**

Submission history

From: Gerhard Mallot [view email]
[v1] Tue, 26 Jan 2010 12:46:59 GMT (46kb)

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