Ref.TH.1751-CERN

NEUTRAL CURRENTS IN SEMILEPTONIC PROCESSES $\Delta T = 0$

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A B S T R A C T

The isoscalar piece of the neutral weak hadronic current is studied in elastic neutrino scattering on targets of isospin zero. If there are no "exotic" currents between non-strange hadrons we obtain : (i) a q^2 dependence in the differential cross-section which is independent of the incident neutrino energy and equal to the well-known electromagnetic structure function ; (ii) equality for the neutrino and antineutrino cross-sections at all energies. If those requirements are satisfied the magnitude of the cross-section directly gives the Weinberg angle. If not, some isoscalar must be present in the current associated with the W^0_μ. Numerical results for the deuterium case are given.

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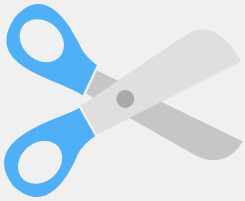

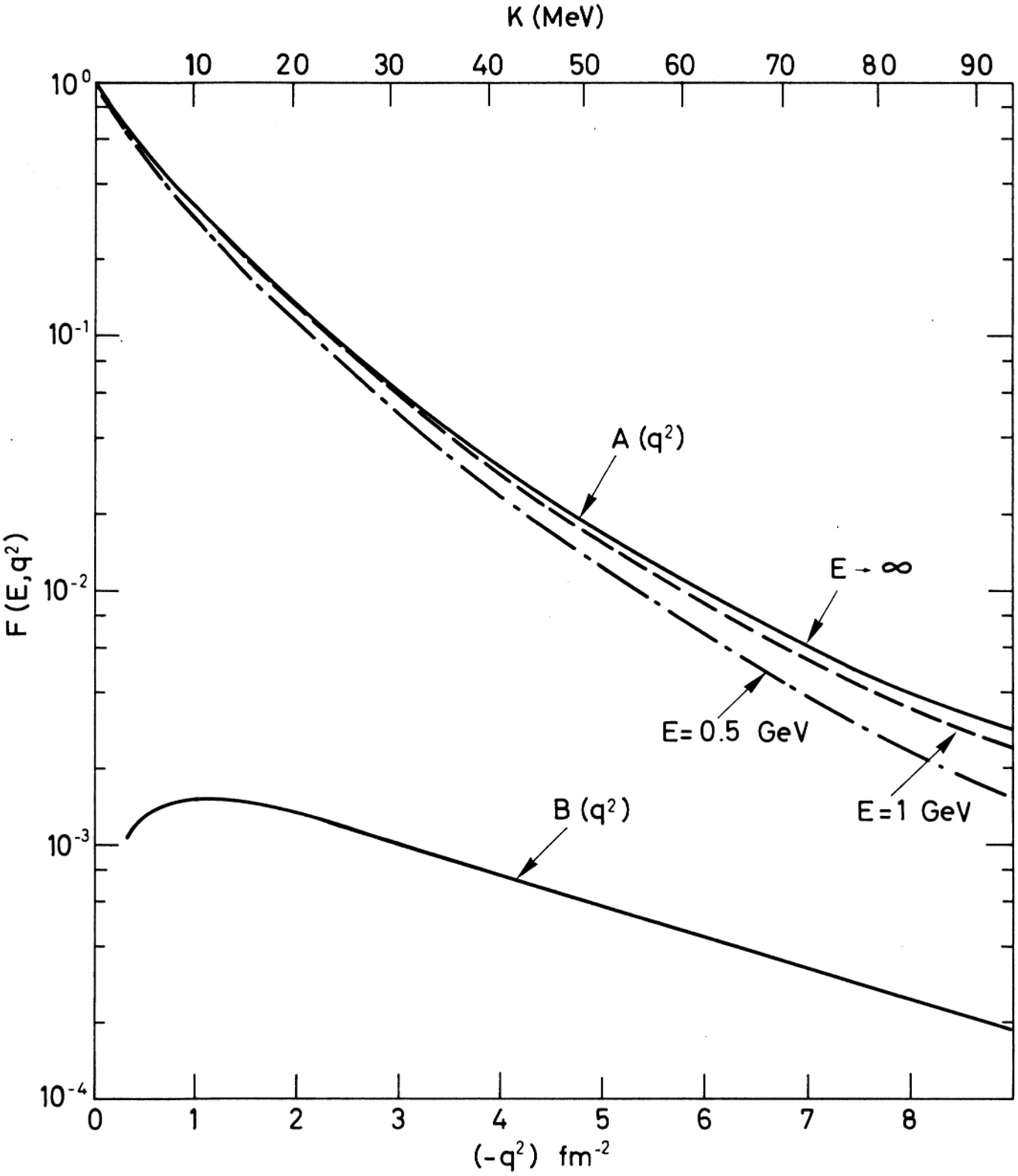
K (MeV)
10
20
30
40
50
60
70
80
90
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
F (E, q^2)
A (q^2)
E → ∞
E= 0.5 GeV
E=1 GeV
B (q^2)
0
1
2
3
4
5
6
7
8
($-q^2$) fm^{-2}