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Empirical Fit to Inclusive Electron Scattering on Nuclei

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An empirical fit has been made to inclusive electron scattering data on nuclei in the kinematic region $0 < W < 4$ GeV and $0 < Q^2 < 10$ GeV^2. Several new high-precision data sets from Jefferson Lab were used to augment the existing world data set. Data on the deuteron and proton were used to obtain a fit to a free neutron target. Simple Fermi-smearing, Coulomb corrections, and a parametrization of the "EMC effect" were used to obtain a "basic" fit for nuclei with $A > 3$, which was adjusted with 25 additional free parameters to fit data on He, berylium, carbon, aluminum, iron, and copoper. The largest adjustments to the basic fit were needed for the transverse cross section in the "dip" region between the quasi-elastic peak and the $\Delta(1232)$ resonance. Approximately 70\% of the data points used lie within 4\% of the fit, and 97\% lie within 10\%. The functional form of the fit was chosen to join smoothly onto fits at higher W and Q^2.

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