

NEUTRON SCATTERING FROM  $^{12}\text{C}$  IN THE FEW-MEV REGION

by

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## ABSTRACT

Neutron total cross sections of natural carbon are deduced from the observed transmission of approximately monoenergetic neutrons through carbon samples of varying thickness. The measurements extend from  $\sim 0.1$  to 4.5 MeV with resolutions of  $\sim 2$  to 100 keV. Neutron differential-elastic-scattering cross sections of natural carbon are measured from 1.5 to 4.0 MeV at incident-neutron energy intervals of  $\sim 100$  keV, over an angular range of  $\sim 20$  to 160 degrees and with energy resolutions of 20 to 50 keV. The experimental results are interpreted in terms of a multilevel R-function analysis. Results are compared with the large body of measured and evaluated neutron total and scattering cross sections and scattered neutron polarizations reported in the literature. The present work suggests that the observed neutron total and scattering cross sections of carbon are physically consistent and suitable for use as a reference standard in experimental studies of neutron processes. The R-function description should provide a convenient description of neutron total and scattering cross sections of carbon as a function of both angle and energy.

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