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Recent GRAAL Results on Nucleon Spectroscopy at 750-1500 MeV

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New precise experimental data on total photo-absorption cross sections are given for hydrogen, deuterium and carbon nuclei in the energy range from 0.75 to 1.5 GeV (see Figure). Measurement was performed with the back scattered tagged gamma beam (GRAAL facility at ESRF) and large acceptance detector LAGRANgE. The hadron contribution was obtained subtracting the background from the total yield. It is found that total photo-absorption cross sections for the deuteron is in strong disagreement with the literature data [1]. Respectively, the free neutron total cross section evaluated by subtraction of the proton cross section from the deuteron one, taking into account the Fermi motion effect, is found to be quite different as compared with [1]. New results show that proton and neutron cross sections are equal to each other within 5% of experimental accuracy. Also we see about 30% difference between the carbon and proton (neutron) cross section in absolute scale (see Figure) which can not be explained by Fermi motion effect in studied energy region. Obtained results are discussed in frame of the MAID model taking into account available data on partial meson photo-production cross sections on free and bound nucleons.

1. C. S. Armstrong et.al., Nucl. Phys. B 41, 445 (1972).

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