

The Structure, Properties and Parameters of Nucleons

Yibing Qiu

yibing.qiu@hotmail.com

Abstract: according to the basic theory of nuclear and particle physics, and related measurement results and experimental data, show the structure, properties and parameters of nucleons.

Main Viewpoints and Conclusions:

We already have known a nucleus is composed of the nucleons, then, giving and determining their structure, properties and parameters are the works which should to be:

A proton is the most elementary particles; a proton with a unit positive charge.

A neutron is compounded of a proton and a π -meson, and the π -meson as a shell and afterbirth, in the form of Soft electric-charged matter, covered and wrapped with the proton.

A π -meson is compounded of an electron and a neutrino; since an electron with a unit negative charge, a neutrino is has no any charge, then the π -meson which compounded by them has a unit negative charge.

And:	$m_{\pi} = m_e + m_{\nu};$	$m_n = m_p + m_{\pi} = m_p + m_e + m_{\nu}.$
	$m_n = 1.00866491682 \text{ u};$	$m_p = 1.00727647012 \text{ u};$
	$m_e = 0.0005485799 \text{ u}.$	
even:	$m_{\pi} = 0.0013884467 \text{ u};$	$m_{\nu} = 0.0008398688 \text{ u};$
	$m_{\pi} \approx 2.53 m_e;$	$m_{\nu} \approx 1.53 m_e.$
and:	$r_p = 0.3 \text{ fm};$ ^[1]	$r_n = 2.0 \text{ fm}.$ ^[1]

And, there be the thickness of the outer π -meson layer of a neutron is 1.7 fm; the neutron's cross-section is two concentric circles with radius in 0.3 fm and 2.0 fm (a experimental result and data shows a neutron has a positively charged core of radius about 0.3 fm surrounded by compensating negative charge between 0.3 and 2.0 fm ^[1]).

Reference

[1] J.-L. Basdevant, J. Rich, M. Spiro, *Fundamentals in Nuclear Physics*, 2005, Springer, p.156