The Structure, Properties and Parameters of Nucleons

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

Main Viewpoints and Conclusions:

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

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

A neutron is compounded by a proton and a π-meson, the π-meson as a shell and afterbirth, in the form of Soft electric-charged matter, covered and wrapped with the proton (a study shows a neutron has a positively charged core of radius about 0.3 fm surrounded by compensating negative charge between 0.3 and 2 fm [1]).

A π-meson is compounded by 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 there: $m_\pi = m_e + m_\nu$; $m_n = m_p + m_\pi = m_p + m_e + m_\nu$.
and: $m_n = 1.00866491682$ u; $m_p = 1.00727647012$ u;
$m_e = 0.0005485799$ u.
even: $m_\pi = 0.0013884467$ u; $m_\nu = 0.0008398688$ u; $m_\nu \approx 1.53\, m_e$.
and: $r_p = 0.3$ fm; [1] $r_n = 2.0$fm. [1]

And, there be the thicknesses of the outer π-meson layer of a neutron is 1.7fm; it is two concentric circles with radius in 0.3fm and 2.0fm (neutron's cross-section).

Reference

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