

The Structures, Properties and Parameters of Nucleons

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Abstract: according to the basic theory of nuclear and particle physics, new related measurement results and experimental data, and giving the structures, properties and parameters of nucleons

Main viewpoints and conclusions

We have already known a nucleus is composed of the nucleons, and now, determining and giving their structures, properties and parameters as following:

A proton is one kind of the most elementary particles; it with a unit positive charge.^[1]

A π -meson is compounded of a neutrino and an electron; since the electron with a unit negative charge and neutrinos with no any charge, then the π -meson which compounded by them with a unit negative charge.^[2]

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. The neutron's cross-section is two concentric circles with radius in 0.3 fm and 2.0 fm; and the thickness of the outer π -meson layer of a neutron is 1.7 fm (an experimental result and data shown 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 ^[4]).^{[2][3][4]}

And: $r_p = 0.3 \text{ fm}$ ^[4] $r_n = 2.0 \text{ fm}$.^[4]

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: $m_\pi = 0.0013884467 \text{ u}$ $m_\nu = 0.0008398688 \text{ u}$
 $m_\pi \approx 2.53 m_e$ $m_\nu \approx 1.53 m_e$.

References

- [1] *The Structure of the Proton* <http://vixra.org/abs/1507.0184>
- [2] *Redefining Leptons (or called Mesons) and Baryons* <http://vixra.org/abs/1503.0151>
- [3] *A New Model of the Neutron Based on π -mesons* <http://rxiv.org/abs/1405.0206>
- [4] J.-L. Basdevant, J. Rich, M. Spiro, *Fundamentals in Nuclear Physics*,
2005, Springer, p.156