Title: Conversations

Subtitle: Analysis of Quantum sounds and 3rd Dimension!

Second Subtitle: Re: Analysis of Quantum sounds and 3rd Dimension!

Author: wizanda

Date: 1153491915
URL: https://www.wizanda.com/modules/newbb/viewtopic.php?topic_id=64

Quote:

Strange Quarks Contribute to the Structure of the Proton

In research performed in Hall C, nuclear physicists have found that stran
the structure of the proton. This result indicates that, just as previous e
strange quarks in the proton's quark-gluon sea contribute to a proton's p
from work performed by the G-Zero collaboration, an international group
institutions, and was presented at a Jefferson Lab physics seminar on Ju

Protons are found in the heart of all matter: the nucleus of the atom. Phy
protons are primarily built of particles called quarks, along with particle
quarks together. There are three permanent quarks in the proton that con
and one "down."

Up and down quarks are the lightest of the possible six flavors of quarks
universe. In addition to the proton's three resident quarks, the peculiar r
allow other particles to appear from time to time. These ghostly particles
fraction of a second, but it's possible that they stay around long enough
the proton. Nuclear physicists set out to catch some of these ghostly par
determined that the nextlightest quark, the "strange" quark, would be the
effect.

According to Doug Beck, a professor of physics at the University of Illino
the spokesperson for the G-Zero collaboration, one way to see these stra
them through the weak interaction. "If we look with photons via the elect
see quarks inside the proton. And then, if we do it with the weak interact
yet distinctly different view of the quarks. And it's by comparing those p
strange quark contribution," Beck says.

Since the hydrogen nucleus consists of a single proton, G-Zero research
electrons into a hydrogen target. They then watched to see how many pro
essentially knocked out of the target, by the electrons.

Throughout the experiment, the researchers alternated the electron beam
run the beam with polarization in one direction, and we look to see how m
Then we turn the beam around, in polarization at least, and measure for
time again and look to see how many protons are scattered. And there wi
about 10 parts per million," Beck says. That's because the electromagnet
(the electrons' spin will not affect the number of protons scattered), whi

(electrons polarized one way will interact slightly differently than electro

"The relative difference in those counting rates tells us how big the weak scattering of electrons from protons. We compare it to the strength of th between electrons and protons, and that gives us the answer that we're l

What the researchers found was that strange quarks do contribute to the particular, Beck says the collaboration found that strange quarks contrib and magnetic fields -- in other words, its charge distribution and magnet

"All quarks carry charge, and one of the things we measure is where the in the proton's overall charge distribution," Beck explains, "And then the are these charged quarks inside the protons, and they're moving around. move around, they can create a magnetic field. In G-Zero, we also measu contribute to the proton's magnetization."

G-Zero allowed the researchers to extract a quantity representing the str a combination of the proton's charge and magnetization. "The data indica contributions are non-zero over the entire range of our measurements," E couple of points that overlap other measurements. They agree, so that's

However, by itself, the G-Zero result does not yet allow the researchers quark's contribution to the charge from its contribution to the magnetizat run coming up in December, and that will help us to try to disentangle th contribution to the charge and the magnetization. So that will give us on allow us to look at those quantities separately," Beck notes.

www.azom.com