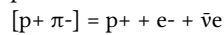


Beta decay mechanism according to the proton-pion model of the neutron and nucleus

Previously, the authors discovered the logical incompleteness of J. Chadwick's conclusion that the neutron is as elementary as the proton and is a partner of the proton in the formation of the nucleus, made by him in conditions of limited knowledge about particles in 1934. In connection with the identified discrepancy, the authors re-identified the components of the nucleus, during which, based on consideration of spins, charges, masses and information about SU(3) symmetry of the full set of currently known particles, it was shown that the neutron can be identified as a composite particle, consisting of one proton and one negative pion, and the nuclei, with the exception of the ^1H nucleus formed by one proton, can be identified as neutron-related composite particles consisting of several protons and one or more negative pions [1, 2]. Based on the new results of identifying the composition of the nucleus, the authors suggested a new proton-pion model of the neutron and nucleus, which was first presented at the international conference NUCLEUS 2023 [3].

The report examines the features of the beta decay mechanism according to the proton-pion model, which describes the neutron beta decay reaction as the reaction of the decay of a negative pion binded to a proton into an electron and a negative neutrino with the release of the proton unchanged due to the decay of the partner:



In particular, the report provides an explanation of the energy reasons why, during the beta decay of a neutron, a negative pion binded to a proton decays only into an electron and an electron antineutrino, despite the fact that in its free form a negative pion decays into an electron and an electron antineutrino only to a small extent degree, predominantly decaying into a muon and a muon antineutrino.

References:

- [1] Kudan P.V., Kapshukov V.N. // Intern. Conf. and Exhib. on Instr. Anal. "BCEIA-2023", 2023, 78
- [2] Kudan P.V., Kapshukov V.N. // Congress of the Russian Society for Mass Spectrometry, 2023, 81
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Section

Experimental and theoretical studies of nuclear reactions

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