DESCRIPTION OF VIRTUAL PHOTONS AND PION CLOUDSIN THE XBPS MODEL OF ELEMENTARY PARTICLES

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ABSTRACT

The description of muons and pions and other light elementary particles in the Exponentially-damped Breit-Pauli-Schrödinger (XBPS) model is reviewed. An analogy is made between the configuration interaction method of electronic structure and the use of virtual photons in the highly accurate theory of quantum electrodynamics. This leads to a discussion of the pion cloud found to surround protons in high-energy scattering experiments. The possibility that the mass of the bare proton is significantly greater than the proton actually observed experimentally is consistent with calculations carried out with the XBPS method. The model is supported by the failure of attempts to prove that the proton is subject to spontaneous decay. The formation of a pion cloud from massless e^+e^- and $\varepsilon\bar{\nu}$ binaries is illustrated. The nomenclature developed in previous work to describe light elementary particles in terms of integral numbers of protons, electrons, neutrinos and their anti-particles is extended to apply to hyperons as well. Finally, the quark-lepton theory of elementary particles and the XBPS model are compared in some detail.

KEYWORDS: *XBPS Model of Elementary Particles, Hyperons, Pion Cloud, Proton-Antiproton Interaction, Quarks and Leptons*