Fundamental Information from Combined Analysis of Nuclear Data and Particle Masses

S.I. Sukhoruchkin, Z.N. Soroko

Petersburg Nuclear Physics Institute NRC "Kurchatov Institute" 188300 Gatchina

Empirical observations of the Standard Model parameters which are unexpectedly manifested simulteniously in the prominent maxima in spacing distributions of nuclear excitations (see Table 2 in [1], Fig. 2, bottom, in [2]) and stable intervals in total distribution of particle mass differences allow us to conclude that their combined analysis demonstrate the universal character of the parameters $\delta = 16m_e$ and m_e.

Additionally the equation (1) is considered, where m_τ, m_μ and m_e are the lepton masses.

$$m_\tau = 2m_\mu + 2m_\omega \approx 2 \cdot 13 \cdot 16m_e - 2m_e + 2 \cdot 96 \cdot 16m_e \quad (1)$$

The manifestation of lepton masses demonstrates the fundamental character of correlations in nuclear data and particle masses.

1. S.I. Sukhoruchkin, Z.N. Soroko, D.S. Sukhoruchkin. *Analysis of nuclear excitations in different elements*. Proc. ISINN-27. JINR-E3-2020-10. p. 40.
2. S.I. Sukhoruchkin, Z.N. Soroko, M.S. Sukhoruchkina. *Grouping of neutron resonance positions*. Proc. ISINN-29. JINR-E3-2023-58. p. 129.