

GROUPING OF NEUTRON RESONANCE POSITIONS

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Measurements of the neutron cross sections of heavy nuclei and their analysis at the IAE and ITEP, carried out in the 1950s and later, made it possible to find out deviations from the statistical model in the distributions of positions and spacings of neutron resonance levels [1].

In this work, we check the distinguishing character of resonance positions of target nuclei: ^{239}Pu (0.296 eV), ^{241}Pu (0.264 eV), ^{241}Am (0.3051 eV) and ^{243}Am (0.419 eV).

Stable intervals in the exactly known high-energy nuclear excitations observed in neutron resonance positions and spacings are compared with stable intervals in the low energy spectrum. For example the interval 1500 eV in Sb, Pd, Hf, U and other isotopes is related to stable excitations close to 1293 keV (the nucleon mass splitting) in these nuclei as $\alpha/2\pi$. The same ratio $\alpha/2\pi = 116 \cdot 10^{-5}$ exists between the superfine and fine structure intervals 1.34 eV and 1.2 keV, $2m_e=1022$ keV, $2M_q=882$ MeV and $6 \cdot M_{H^0} = 6 \cdot 125$ GeV [2].

1. S.I. Sukhoruchkin. Electron mass as the base parameter of the Standard Model. These abstracts.
2. S.I. Sukhoruchkin. Electron-based Constituent Quark Model. Nucl. Part. Phys. Proc. **318 - 323** (2022) 142.