STUDY OF THE PROTON SHELL STRUCTURE EVOLUTION OF EVEN-EVEN Zr ISOTOPES WITH $50 \le N \le 82$ WITHIN DISPERSIVE OPTICAL MODEL

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The method to determine the parameters of dispersive optical potential (DOP) was proposed in [1, 2] for unstable spherical and close to them even-even nuclei. The method is based on the analysis of the available experimental data on single–particle energies E_{nlj} and occupation probabilities N_{nlj} for single-particle orbits and subsequent extrapolation of the parameters to the region of unstable nuclei. The extrapolated parameters are corrected in order to achieve an agreement between the calculated number of protons (neutrons) and Z (N) of the nucleus.

The method was used to calculate E_{nlj}^{DOP} and $N_{nlj}^{BCS}(E_{nlj}^{DOP})$ of the proton single-particle states in even-even Zr isotopes with $50 \le N \le 82$. The resulting single-particle energies agree with those calculated using various parameterizations of the Skyrme forces [3] within 10-15%. Single-particle energies $E_{2p_{1/2}}^{DOP}$ and $E_{1g_{9/2}}^{DOP}$ are close to the evaluated or predicted proton separation energies (with the opposite sign) from (Z=40, N) and (Z=41, N) nuclei correspondingly. This result evidences in favor of N=40 subshell closure throughout the Zr isotopic chain with $50 \le N \le 82$.

1. O.V.Bespalova, E.A.Romanovsky, T.I.Spasskaya // Phys. Atom. Nucl. 2014. To be published.
2. O.V.Bespalova, T.A.Ermakova, A.A.Klimochkina, *et al*. // Bull. RAS. Phys. 2014. To be published.
3. M.Bender *et al*. // Phys. Rev. C. 2008. V.80. 064302.