Contribution ID: **414**   Type: **Poster report**

Phenomenological approach to extrapolation of nuclear binding energies in the transfermium region

Wednesday 14 October 2020 18:50 (20 minutes)

Nowadays all the elements up to 118th are known due to success of experimental nuclear physics in new heavy element synthesis [1], however, not all the masses of new nuclides have been measured. In our work, the phenomenological approach based on local mass relations is implemented to predict masses of unknown isotopes. This approach is characterized by mathematical simplicity and accuracy [2], especially when it is concerned with mass relations for residual proton-neutron interaction [3, 4]. In the region of heavy and superheavy elements the behavior of various mass relations associated with nucleon correlations is considered. Estimations of nuclides'masses and α-decay energy values for elements with Z=107-110 are gained by approximation of these mass relations. The results are compared with calculations using other approaches [5-7] and also with the machine-learning based calculations.

1. Yu.Ts.Oganessian et al. // Phys. Scr., 2017. 92, p. 023003.

2. D.Lunney et al. // Rev. Mod. Phys., 2003. 75, 3, pp. 1021-1082.

3. B.S.Ishkhanov et al. // Chin. Phys. C, 2019. 43, p. 014104.

4. J.Janecke et al. // At. Data and Nucl. Data Tabl. 1988. 39, pp. 265-271.

5. H.Jiang et al. // Phys. Rev. C, 2012. 85, p. 054303.

6. M.Bao et al. // Phys. Rev. C, 2014. 90, p. 024314.

7. C.Ma et al. // Phys. Rev. C, 2020. 101, p. 045204.

Author: Mr SIMONOV, Makar (Lomonosov MSU)

Co-authors: Prof. ISHKHANOV, Boris (Moscow State University, Faculty of Physics, Moscow, Russia; Moscow State University, Skobeltsyn Institute of Nuclear Physics, Moscow, Russia); Dr TRETYAKOVA, Tatyana (Skobeltsyn Institute of Nuclear Physics (SINP), MSU, Moscow, Russia.); Dr VLADIMIROVA, Elena (Moscow State University, Moscow, Russia)

Presenter: Mr SIMONOV, Makar (Lomonosov MSU)

Session Classification: Poster session 1 (part 2)

Track Classification: Section 1. Experimental and theoretical studies of the properties of atomic nuclei.