Contribution ID: **404** Type: **Poster report**

Time-dependent analysis of neutrons transfer reactions ^{181}Ta(^{18}O,^{19}O) at near-barrier energies

Tuesday, 13 October 2020 18:35 (20 minutes)

Numerical solution of the time-dependent Schrodinger equation (TDSE) 1 is used for studying neutron transfer processes at near-barrier energies. The evolution of the wave functions for outer neutron is determined for reactions ^{181}Ta(^{18}O,^{19}O). TDSE allows us to visualize the dynamics of taking place processes [1-3]. The transfer probabilities are calculated for outer neutron shells of the colliding nuclei. The results of calculations of transfer cross sections are in satisfactory agreement with experimental data [4] for reaction ^{181}Ta(^{18}O,^{19}O). High probability of neutron transfer from the ^{181}Ta nucleus to the $2s$ orbital of ^{18}O nucleus at near-barrier energies has been yielded (see Figure 1). In previous our work [4], differential cross sections for the formation of oxygen isotopes in the reaction ^{18}O + ^{181}Ta have been measured at projectile nucleus energy 10A MeV on the high-resolution magnetic spectrometer MAVR. Theoretical analysis has been performed in the DWBA formalism using the FRESCO code under the assumption of sequential neutron transfer mechanism.

Indico rendering error

```
Could not include image: Problem downloading image (https://cloclo13.cloud.mail.ru/weblink/view/4xQM/nYEV
```

1 A.K.Azhibekov, V.V.Samarin, K.A.Kuterbekov, Time-dependent calculations for neutron transfer and nuclear breakup processes in ^{181}Li+aBe and bLi+cC reactions at low energy, Chinese Journal of Physics 65 (2020) 292.
2 Yu.E. Penionzhkevich, Yu.G. Sobolev, V.V. Samarin et al., Energy dependence of the total cross section for the dLi+^{18}Si reaction, Phys. Rev. C 99 (2019) 014609.
3 Yu.E. Penionzhkevich, Yu.G. Sobolev, V.V. Samarin, M.A. Naumenko, Peculiarities in total cross sections of reactions with weakly bound nuclei ^{181}He, $E_{\text{c.m.}}$Li // Physics of Atomic Nuclei 80 (2017) 928.
4 A.K. Azhibekov, V.A. Zernyshkin, V.A. Maslov, Yu.E. Penionzhkevich et al., Differential Production Cross Sections for Isotopes of Light Nuclei in the bO + V_{B}Ta Reaction // Physics of Atomic Nuclei 83 (2020) 94.

Primary author: AZHIBEKOV, Aidos (Joint Institute for Nuclear Research)

Presenter: AZHIBEKOV, Aidos (Joint Institute for Nuclear Research)

Session Classification: Poster session 2 (part 1)

Track Classification: Section 2. Experimental and theoretical studies of nuclear reactions.