Contribution ID: **115** Type: **Oral report**

Direct calculation of quasi-stationary states of the neutron plus nonspherical nucleus system.

Thursday, 23 September 2021 16:15 (25 minutes)

The states of the Be^{11} nucleus as a core of Be^{10} plus a neutron are studied in [1, 2], as well as many others. The Be^{10} nucleus is an almost ideal object for studying the effects associated with the non-spherical shape of the nucleus. It has the largest deformation parameter for stable and long-lived nuclei. Usually the coupled channel method is used, the problem is reduced to a system of equations in a spherical symmetric field. In this work the method of direct solution of scattering by an axially symmetric potential has been used. Resonances in scattering, which are obviously also quasi-stationary states, have been calculated.
The differences arising from these two approaches are shown. The main effect is the nature of the resonances. Resonances are the result of the interaction of a nuclear potential and an analogue of a centrifugal potential. This follows from a direct calculation using the axial symmetry of the problem. The resonances here are equivalent to the states of a complex nucleus, which is a neutron and a deformed core.
This work was supported by the Grant No. BR09158499 (Development of complex scientific research in the field of nuclear and radiation physics on the basis of Kazakhstan accelerator complexes) of the Ministry of Energy of the Republic of Kazakhstan.

1. H. Esbensen, B. A. Brown, and H. Sagawa Phys. Rew. C 51, (1995), 1274-1279
2. I Hamamoto and S Shimoura J. Phys. G: Nucl. Part. Phys. 34 (2007) 2715–2725

Primary author: KRASSOVITSKIY, Pavel (Join institute for nuclear research)

Co-authors: FEDOSIMOVA, Anastasiya; Prof. PEN'KOV, Fedor (Kazakh National university)

Presenter: KRASSOVITSKIY, Pavel (Join institute for nuclear research)

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

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