Referee Report on the theme 7

"Commissioning and first results of the ACCULINNA-2 fragment separator"

With the ACCULINNA-1 fragment separator, investigation of the beta-delayed alpha decay of 11Be was performed using the implantation of the radioactive beam particles into the optical time-projection chamber. Also data were collected for isotopes 8Li, 8B and 9C for the crosscheck measurements. The obtained results show that the implantation method works well.

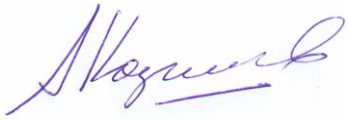
First experiments with beams of radioactive nuclei provided by the new facility ACCULINNA-2 have been carried out in the beginning of this year. Fragmentation of the 15N nucleus on the natural beryllium target was used to produce 6He and 9Li beams with intensity about 10**5 pps and energy about 25 A MeV. The radioactive beams were focused on the CD2 target for studies of the secondary reactions on the deuterium nucleus.

First of all, the 6He + d scattering, both elastic and inelastic, were investigated in a wide angular range. Good statistics was accumulated and data analysis is in progress.

Also the (d,3He) reaction with the 6He projectile was investigated to populate the 5H ground and exited states. To detect 3He the ΔE-E telescope consisting of 20-micron SSD and 1000-micron DSSD was used. The telescope works well and separates the 3He events in presence of the 4He background. The telescope will be applied to search for 7H in the (d,3He) reaction with the 8He projectile.

Using the 9Li beam, the reaction 9Li(d,p)10Li → n+9Li was investigated with detection of protons at backward angles in the laboratory system in coincidence with neutrons. The obtained data will be used to estimate experimental efficiency, energy resolution and experimental conditions for such kind of measurements with the ACCULINNA-2 fragment separator.

In general, the ACCULINNA activities are promising, demonstrate a high scientific level and should be continued.



A.A. Korsheninnikov

May 28, 2018