Contribution ID: **282** Type: **Oral**

ANC for the 7Li→{6He+p} overlap from the 7Li(d,3He)6He reaction

Wednesday 2 July 2025 12:50 (20 minutes)

The 7Li nucleus has a pronounced cluster nature as α+t. However, the one-nucleon component of the ground state is also of interest for a more complete understanding of the structure of the nucleus. Also it may be important in the nuclear-astrophysical processes of the Big Bang, such as the reaction 7Li(3H,4He), which leads to the 7Li nucleus destroy and a change in the 6Li/7Li abundance ratio.
In this work, the values of the spectroscopic factor (SF) and the square of the asymptotic normalization coefficient (ANC) of the p+6He coupling in the 7Li nucleus were estimated using a modified DWBA analysis [1] of the experimental differential cross sections (DC) of the 7Li(d,3He)6He reaction. The DCs of the reaction were extracted from the data of the 7Li+d experiment, carried out on deuteron beam of the U-150M cyclotron of the INP RKaz at energies Ed=14.5 and 25.0 MeV [2,3].
At both energies, the DCSs (which are new data) exhibit clear single-particle features, and the region of the main diffraction maximum is described rather well.
The analysis shows that proton transfer is practically peripheral at 3He emission angles in the region of the main diffraction maximum. The value of the ANC squared, C27Li→6He+p, is estimated at 10.5±2.0 fm-1, which is very little sensitive to the ambiguities of the parameters of the optical model and the binding potential of the proton in the 7Li nucleus. The SF Z=0.89 at "standard"geometry parameters of the 6He+p binding potential.

Primary author: ARTEMOV, Sergey (Institute of Nuclear Physics, 100214 Tashkent, Uzbekistan)

Co-authors: KARAKHODZHAEV, Ahror (Institute of Nuclear Physics, 100214 Tashkent, Uzbekistan); SON, Irina (Institute of Nuclear Physics, 100214 Tashkent, Uzbekistan); NASSURLLA, Maulen (Institute of Nuclear Physics, 100214 Tashkent, Uzbekistan); BURTEBAYEV, Nassurlla (Institute of Nuclear Physics, 100214 Tashkent, Uzbekistan); TOJIBOEV, Olimjon (Institute of Nuclear Physics, 100214 Tashkent, Uzbekistan); SAKUTA, Stanislav (NRC "Kurchatov Institute")

Presenter: SON, Irina (Institute of Nuclear Physics, 100214 Tashkent, Uzbekistan)

Session Classification: 2. Experimental and theoretical studies of nuclear reactions

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