Contribution ID: **445** Type: **Oral talk (15 min + 5 min questions)**

ASYMMETRY EFFECTS MODELLING IN SLOW NEUTRONS INDUCED PROCESSES ON 35CL NUCLEUS

Tuesday, 12 July 2022 17:10 (20 minutes)

Asymmetry and spatial parity non-conserving effects were investigated in slow neutrons induced processes on 35Cl nucleus. Forward — backward, left — right and parity non conservation effects were evaluated in the (n,p) reaction for neutrons energy up to 1 keV. Cross sections, necessary angular correlations, asymmetry and spatial parity breaking effects were evaluated in the frame mixing parity of compound nucleus states with the same spin and opposite parities [1,2]. Theoretical evaluations of the effects were compared with experimental data obtained at FLNP JINR Dubna and Peterburg Nuclear Physics Institute [3,4]. Forward — backward, left — right and parity non conservation effects are important because using theoretical evaluations and experimental results, matrix element of weak non leptonic interaction can be obtained [4].
For each investigated effect, angular correlations were obtained using (n,p) reaction amplitudes from [1,2]. Further, applying direct Monte-Carlo method theoretical expressions and numerical evaluation of protons angular distributions were obtained considering different possible terms in angular correlations. Using protons angular distribution, computer simulation of the asymmetry and parity breaking effects were realized considering targets with finite dimensions and different densities. For each analyzed effect. precision of the experiment was determined and from computer modeled asymmetry coeffcients weak matrix elements was extracted.
The present results will be applied in the investigations of new experiments proposed at intense neutrons source IREN, from FLNP JINR Dubna dedicated for the measurements of asymmetry effects in the 35Cl(n,p)35S nuclear reaction with slow neutrons.

1. V.E. Bunakov, L.B. Pikelner, Progess in Particle and Nuclear Physics, 39, 337 (1997).
2. V.V. Flambaum, G.F. Gribakin, Progess in Particle and Nuclear Physics, 35, 423 (1995).
3. A. Antonov, V.A. Vesna, Y.M. Gledenov, Soviet Journal of Nuclear Physics, 48(2), 193 (1988).
4. A.I. Oprea, C. Oprea, Yu.M. Gledenov, P.V. Sedyshev, C. Pirvutoiu, D. Vladoiu, Romanian Reports in Physics, 63(2), 357 (2011)

The speaker is a student or young scientist

No

Section

1. Experimental and theoretical studies of nuclear reactions

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