**Search for violation of the spin-parity and isospin conservation law in the decay of the 3.56 MeV $0^+$ level in $^6$Li**

V. Z. Goldberg, J. C. Hardy, A. Mukhamedzhanov, G. Tabacaru, G. Chubarian, R. E. Tribble
G. V. Rogachev,[1] E. Johnson,[1] C. Spitaleri,[2] S. Cherubini,[2] S. Romano,[2] M. Gulino,[2]
A. Tumino,[2] R. G. Pizzone,[2] M. La Cognata,[2] L. Lamia,[2] N. Shulgina,[3] and W.H. Trzaska[4]
[1]*Department of Physics, Florida State University, Tallahassee, Florida 32306*
[2]*Laboratori Nazionali del Sud-INFN, Italy*
[3]*Kurchatov Institute, R-123182 Moscow, Russia*
[4]*University of Jyvaskyla, Jyvaskyla, Finland*

Among nuclear processes for which spatial parity is not conserved (PNC processes), a distinguished role is played by those with changing isospin, $\Delta T = 1$. These are initiated due to the existence of only weak neutral currents which are of paramount interest in developing unification schemes of gauge fields.

Parity nonconservation in nuclei is commonly analyzed in terms of parity violating nucleon-nucleon potential, based on one-boson exchange. The parameters of the potential (weak nucleon-meson couplings) are determined theoretically with large uncertainty (around 300%), depending on the model assumptions

Although the PNC effects in heavy nuclei are quite large owing to the enhancement mechanisms, exploration of the PNC transitions should preferably be carried out in few nucleon systems as for these the PNC effects can be separated (theoretically) from the nuclear interaction background.

Search for T=1 levels in $^{10}$B, which can populate T=1, $0^+$ (3.56 MeV) level in $^6$Li as a result of α decay, was made in the $^9$Be+p resonance interaction at LNS-INFN, Italy. (The search for the parity violating α decay of the 3.56 MeV level in $^6$Li was a well known challenge for various experimental groups for many years [1,2].) The excitation function for the $^9$Be+p→α+$^6$Li (3.56 MeV) was studied in the region of 20-55 MeV of the $^9$Be incident energies using α+$^6$Li coincidence events. The $^9$Be+p elastic scattering, as well as other possible decay channels of the resonances in $^{10}$B were also studied.

It was found that a resonance at excitation energy of 8.9 MeV in $^{10}$B was the best candidate for the population of the 3.56 MeV level in $^6$Li, and this resonance should be used for future search of the $^6$Li decay. Resonances at higher excitation energies in $^{10}$B manifest also itself in the α+$^6$Li (3.56) decay channel. After determination of their quantum characteristics, we hope to find evidence for the α+α+p+n structure.

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[2] B. G. H. Robertson *et al.*, Phys. Rev. **C 29**, 755 (1984).