

*Reference on the APLOM2 project*  
*Measurement of analyzing powers for the reaction*  
 *$p(\text{pol})+\text{CH}_2$  up to 7.5 GeV/c*  
*and  $n(\text{pol})+A$  up to 4.5 GeV/c at the Nuclotron*

Elastic electromagnetic form factors of the nucleon at high transferred momenta  $Q^2$  contain an unique information on the radial distribution of electric charge and magnetic moment inside the nucleon. At Jefferson Lab (JLab), four nucleon form factors have been measured up to  $Q^2=8$  (GeV/c)<sup>2</sup> with polarized electron beam at energy up to 6 GeV and have demonstrated very interesting features widely discussed in current literature and many conferences. Knowledge of the all four nucleon form-factors allows to separate contribution of quarks of different flavor. On the whole, this experimental data provide a test of QCD and many theoretical works based on different non-perturbative approaches have been done since JLab publications for the form factor ratio data. The JLab proposal for double-polarization measurements up to 12 GeV with transferred momentum  $Q^2$  up to 12-15 (GeV/c)<sup>2</sup> is approved by the Jlab PAC. Since polarization of the recoil nucleon has to be measured in this experiment, one has to know analyzing powers of the suitable reactions with polarized initial proton and neutron at corresponding energies that is the aim of the APLOM2 project.

Within the APLOM2 project will be measured the analyzing power for the reaction  $\{\vec{p}\}+\text{CH}_2$  at proton momentum 5.3, 6.5 and 7.5 GeV/c and for the reaction  $\{\vec{n}\}+\text{CH}$  at 5 GeV/c and 6 GeV/c at the JINR Nuclotron. These measurements will be the next step of the previous ones successfully performed at lower momenta (1.75 - 5.3) GeV/c and used as a basis for the polarimetry in the above mentioned measurement at JLab.

In new measurement will be used drift chambers that will provide a high accuracy of the scattered angle measurements, and hadron calorimeter will be used in order to reject low energy hadrons scattered off the target. All equipment required to make this experiment at VBLHEP/JINR does exist and have been tested with the beam. The funds required is only one half of the total amount, another part of which will be covered by JINR partners of this projects.

Realization of the project will allow one to obtain new data on analyzing powers for the reactions induced by protons and neutrons on C, CH<sub>2</sub>, Cu necessary for the Jlab experiment on measurement of electromagnetic proton and neutron form factors up to 12-15 (GeV/c)<sup>2</sup>. Furthermore, it will offer a possibility to perform at JINR nuclotron other polarization experiments at the corresponding energies.

I would recommend this project for realization with the first priority.



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