Reference

on project

**BM@N@SRC «Study of nucleon correlations at smaller distances»**

for 2017-2021 (addition to project **BM@N**)

Theme 02-0-1065-2007/2019**,** project leader M.N.Kapishin

The research programme in the offered addition to the project BM@N is related with the study of high pulse () component in nuclei. From the ratio of uncertainties it follows that the high pulse component is produced by a pair of nucleons at smaller distances. These pairs of nucleons are not described in the model of the middle field of the nucleus. Moreover, the attempts to describe interactions between the nucleons at the distances compared with the «size» of the nucleon basing on quantum chromo dynamics meet the problem of confinement.

Probably, the answer to this issue can be given by calculations on gauges. The knowledge of the properties of the nucleon correlations at smaller distances is also of great interest for the physics of the macro world, for example, to describe the construction of the neutron stars. Obtaining the experimental information about the structure of «short nucleon correlations» is important and worth all possible supporting.

Experiments in this field have been carried out in many accelerator centers of the world (JLab, Darmstadt, etc.). It is necessary to emphasize that the energy and quality of the beams of the accelerator complex at the Laboratory of High Energy Physics of Joint Institute for Nuclear Research are optimal to perform correlation measurements of protons in the so called reverse geometry.

These measurements are planned to carry out mainly by using the detectors of the BM@N set-up and that is why big additional finances and manpower will not be required.

Realization of the project is planned to fulfill in a wide international collaboration consisting from physicists of the JINR member-countries and also physicists from the USA and Israel.

It is necessary to stress that the study of high pulse component in the nuclei is a traditional task for the Laboratory and expansion of the project by measuring with the deuteron beams including the polarized ones, can make the project to be very promising for many years.

I recommend the offered addition to the project to be approved by the Programme Advisory Committee for particle physics and realized during the period of 2017- 2021 years.

Doctor of Phys.-Math Sciences, Professor

A.I. Malakhov

25.04.2017