

REVIEW ON THE PROJECT

“CONCEPTUAL AND TECHNICAL DESIGN OF SPIN PHYSICS DETECTOR”

The purpose of the project is to develop a detector capable of measuring spin effects dependent on polarization at the NICA accelerator in the JINR based on polarized proton and deuteron beams. The development of such a detector is important in order to study Drell-Yan processes and processes with direct photon production and some others including elastic reactions and production of J/Ψ particles. The main idea is to develop a universal detector that may be relatively easily upgraded. The geometry of the detector should cover about 4π . The detector will consist of two end parts and one central. Detector layout is more or less standard. The project gives preliminary Monte Carlo simulations. It is assumed that the project on the development of the spin detector will be implemented in five years.

I think that the project is rather interesting as it allows clarifying the role of a number of non-perturbative effects in QCD. It is especially interesting to obtain new information on spin-dependent parton distributions. In addition, the study of the Drell-Yang process and direct photon production in transition regions between the field of application of perturbation theory and the strong-coupling region is very important, since it allows us to understand the main effects associated with the transition from a small coupling constant to the large one.

One of the disadvantages of the project is that the text of the project does not compare the capabilities of the proposed spin detector based on the NICA accelerator to the competing RHIC, J-PARC, FAIR, and other facilities. It is not clear whether the proposed detector will provide fundamentally new information or the special interest is in additional (maybe very necessary) measurements. In other words, there is no clear answer to the question: what fundamentally new and important can do a new detector, which is unavailable for existing and future competing experiments? It also gives an impression that Monte Carlo simulations for various reactions, which cross sections will be measured, are either not performed or are given very fragmentary. There is no discussion of the accuracy of cross-section measurements and other characteristics that can be achieved by this detector, including a comparison of systematic errors with errors of competing facilities.

I want to emphasize once again that despite the comments above, I believe that the development of a spin detector for the NICA accelerator is an important step for understanding the physics of spin phenomena and its construction should be encouraged.

Anonymous