

RCNP

NUCLEAR PHYSICS

LECTURE and EXPERIMENT SEMINAR

Title	Instrumentation for experiments with polarized ions and recent progress in JINR		
Lecturer	Prof. Eugene A. Stokovsky (LHEP of JINR, Dubna, Russia / RCNP)		
Date/Time	Monday, 20th Feb 2017	10:30 – 12:00	Lecture
		13:30 – 14:30	Seminar
Place	Lecture Room 1, 6 th floor, RCNP Main bldg.		

Abstract:

This lecture is addressed to young physicists and students first of all. The main topic is devoted to a question, how to produce polarized ion beams (proton and deuteron cases will be used as an example). Some basic definitions and conventions will be given as well as examples of typical sources of polarized ions. Since the case of particles with spin $\frac{1}{2}$ is well described in textbooks, more attention will be paid to features of operation with vector particles having spin 1 (deuterons are the best example). Particular questions concerning polarized targets with spin 1 nuclei, will be considered in the final part of the lecture.

Finally (in the seminar part), activity of the LHEP in 2016 year will be outlined, in particular works, resulted in provision of polarized deuteron beam from the Nuclotron again.

The outline of the topics of this lecture and seminar is as follows.

Lecture:

1. Introduction.
 - a. Definitions; Madison convention.
 - b. Spin 1 case (vector and tensor polarizations and analyzing powers).
2. Polarized ion sources: basic principles of operation and examples of the sources.
 - a. Basic physical phenomena used to produce polarized ions.
 - b. Saclay source of polarized protons and deuterons.
 - c. New source of polarized protons and deuterons for the LHEP of JINR Nuclotron.
3. Polarized targets.
 - a. "Frozen spin" targets.
 - b. Connection between the vector and tensor polarizations for targets with the spin 1 nuclei.

Seminar:

1. Renewal of the polarized deuteron beam at the LHEP of JINR (results of the Nuclotron runs 52 and 53).
2. The latest news concerning progress in realization of the NICA project at JINR.

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