

**Caucasian-German School and Workshop on Hadron Physics, Tbilisi,
Georgia (28.08.04 - 04.09.04)**

**SPIN PHYSICS ON THE ACCELERATING COMPLEX
OF THE VEKSLER-BALDIN LABORATORY
OF THE HIGH ENERGY PHYSICS
JINR**

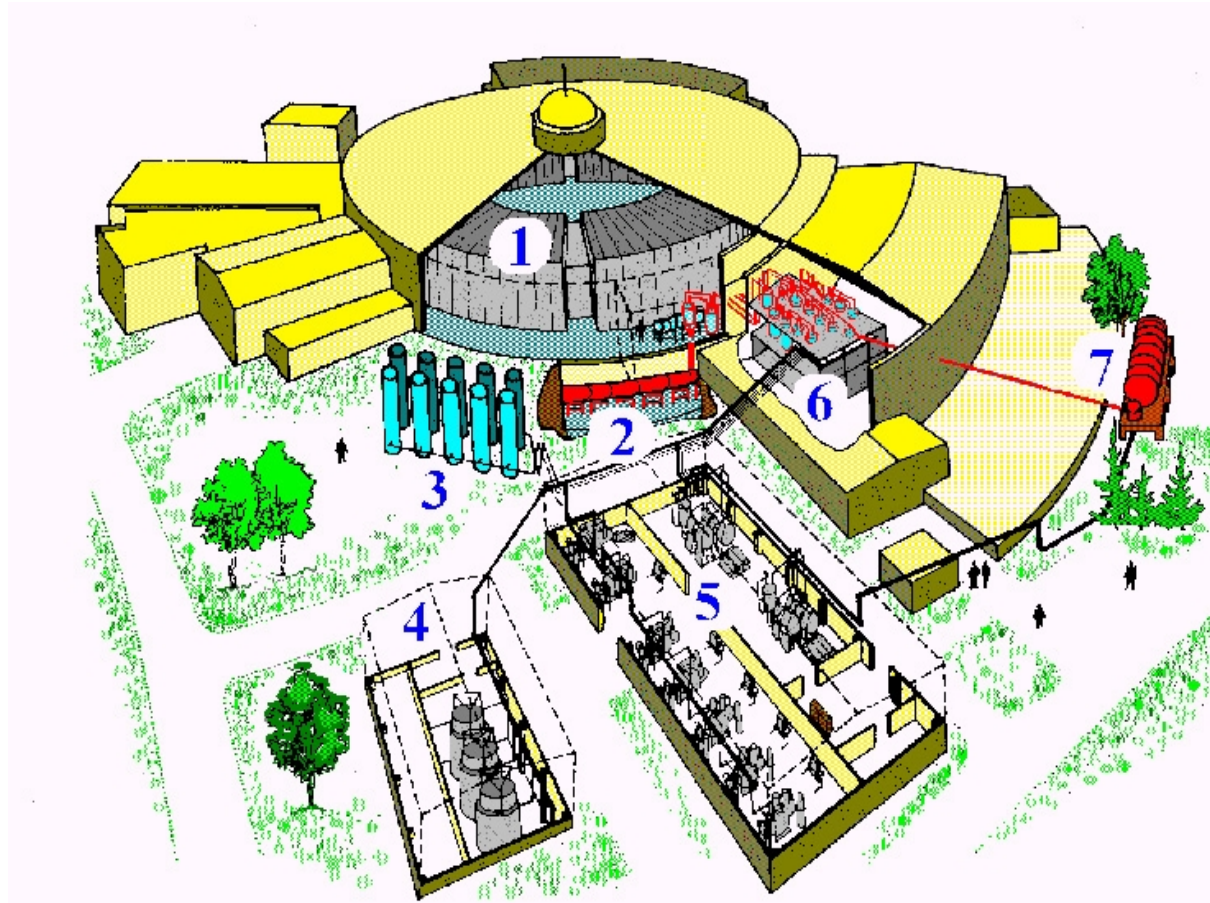
Victor Glagolev
31.08.2004

My brief review is devoted to a part of the common program of researches in VBLHE, namely polarizing experiments.

They have begun for the old accelerator - synchrophazotron and now proceed on the Nuclotron. I touch on experiments with pionless reactions only. That are:

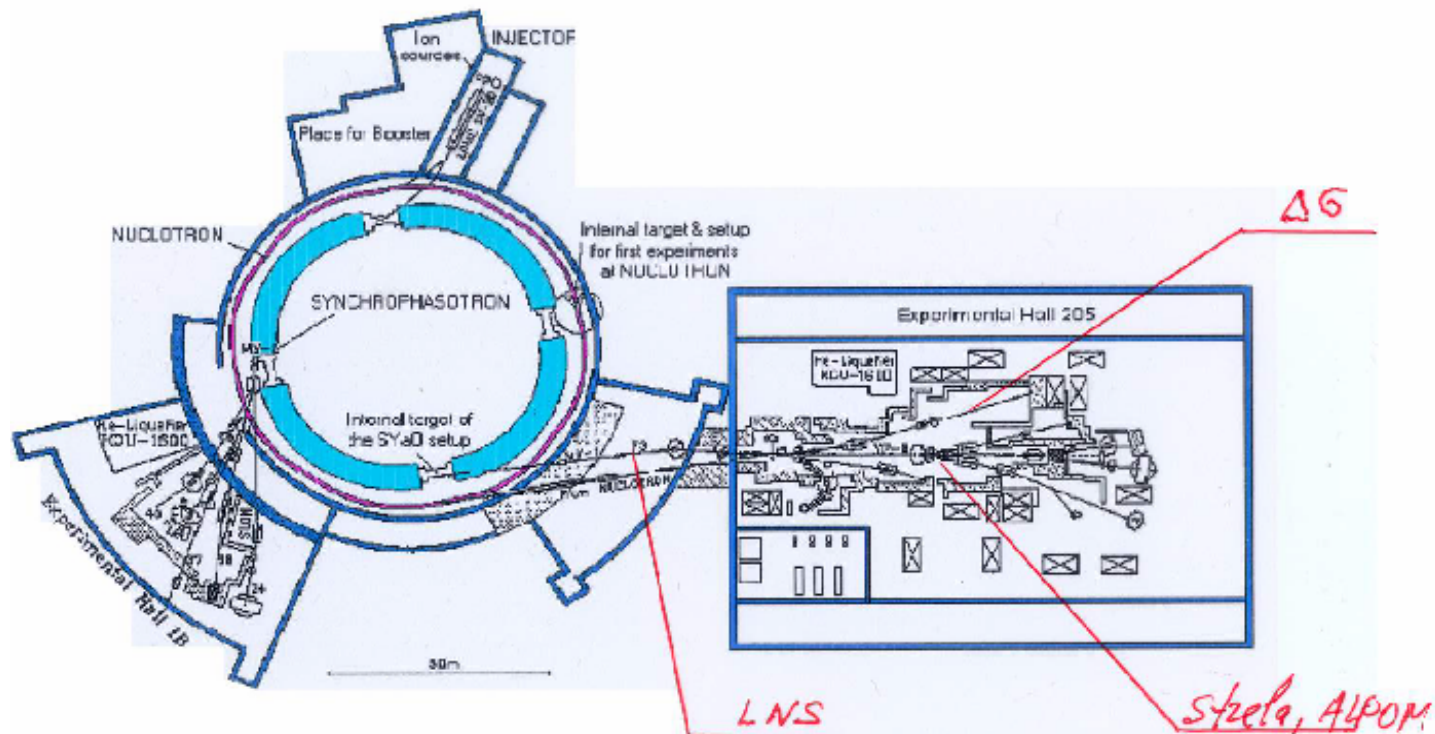
Delta-sigma	(Strunov, Sharov)
Strela	(Glagolev, Piskunov)
ALPOM	(Piskunov, Sitnik)
LNS, PHe3	(Ladygin)

Accelerating complex VBLHE JINR

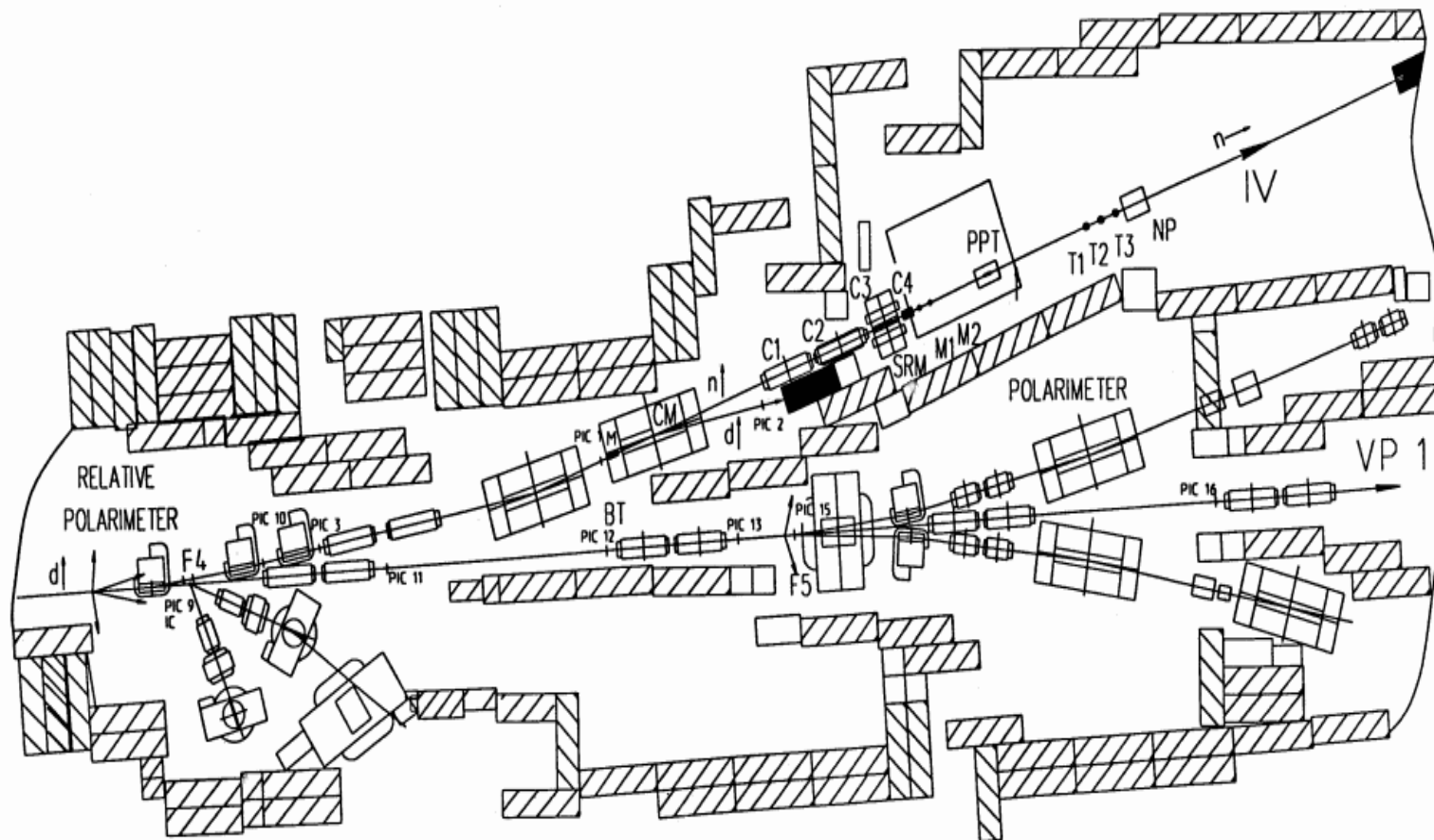


Scheme of the Nuclotron beams

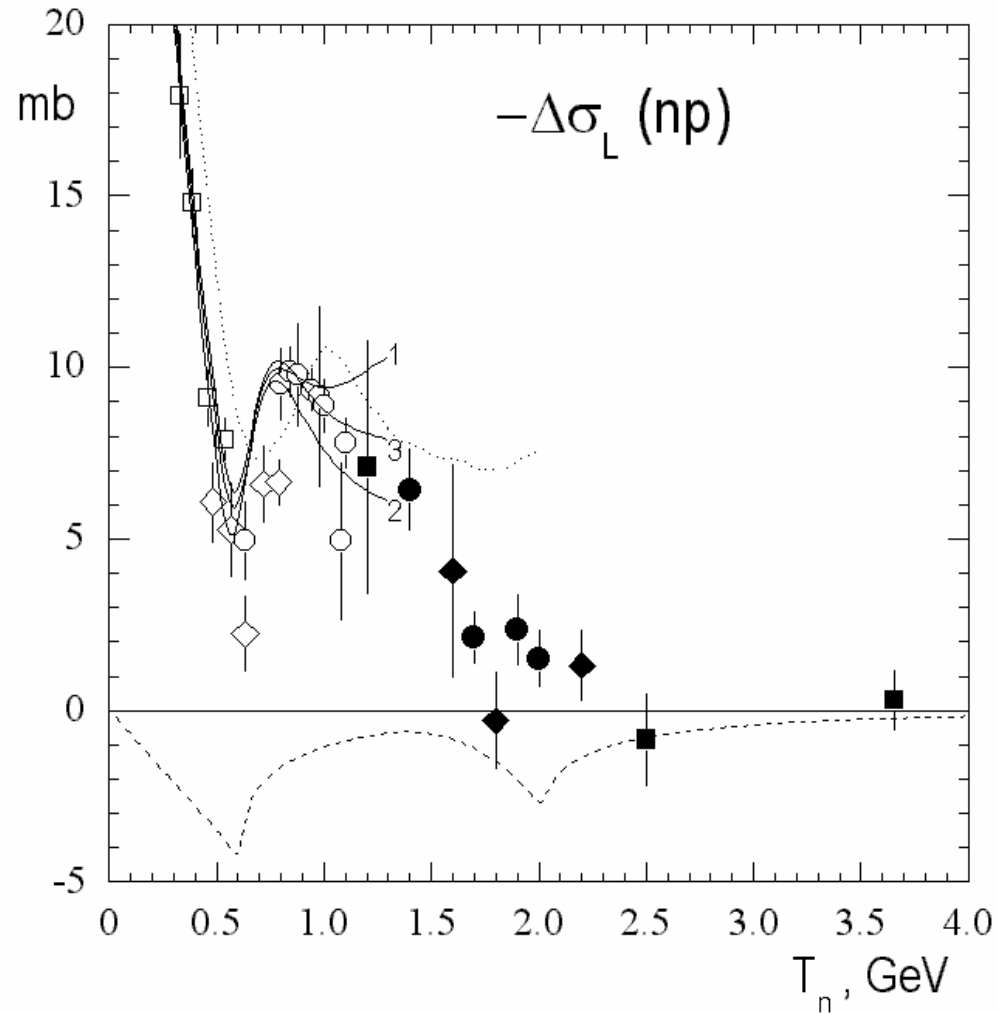
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Delta-sigma experiment



Delta-sigma



The reception of new results on $-\Delta\sigma_T$ becomes possible after closing -up on perfection of the polarized target at the end of this year.

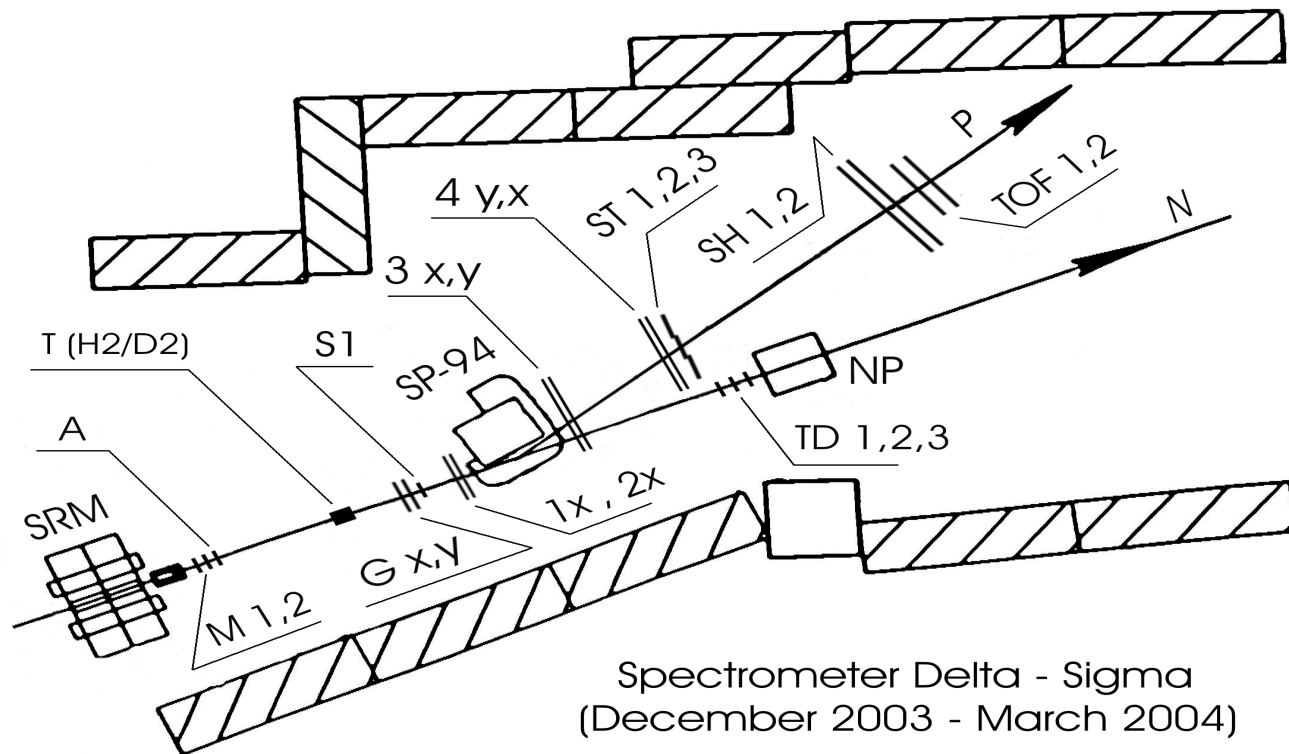
Recently set-up Delta - sigma was modernized.

Namely, was constructed spectrometer of protons from charge-exchange reaction $np - pn$.

The target was filled either liquid hydrogen, or liquid deuterium.

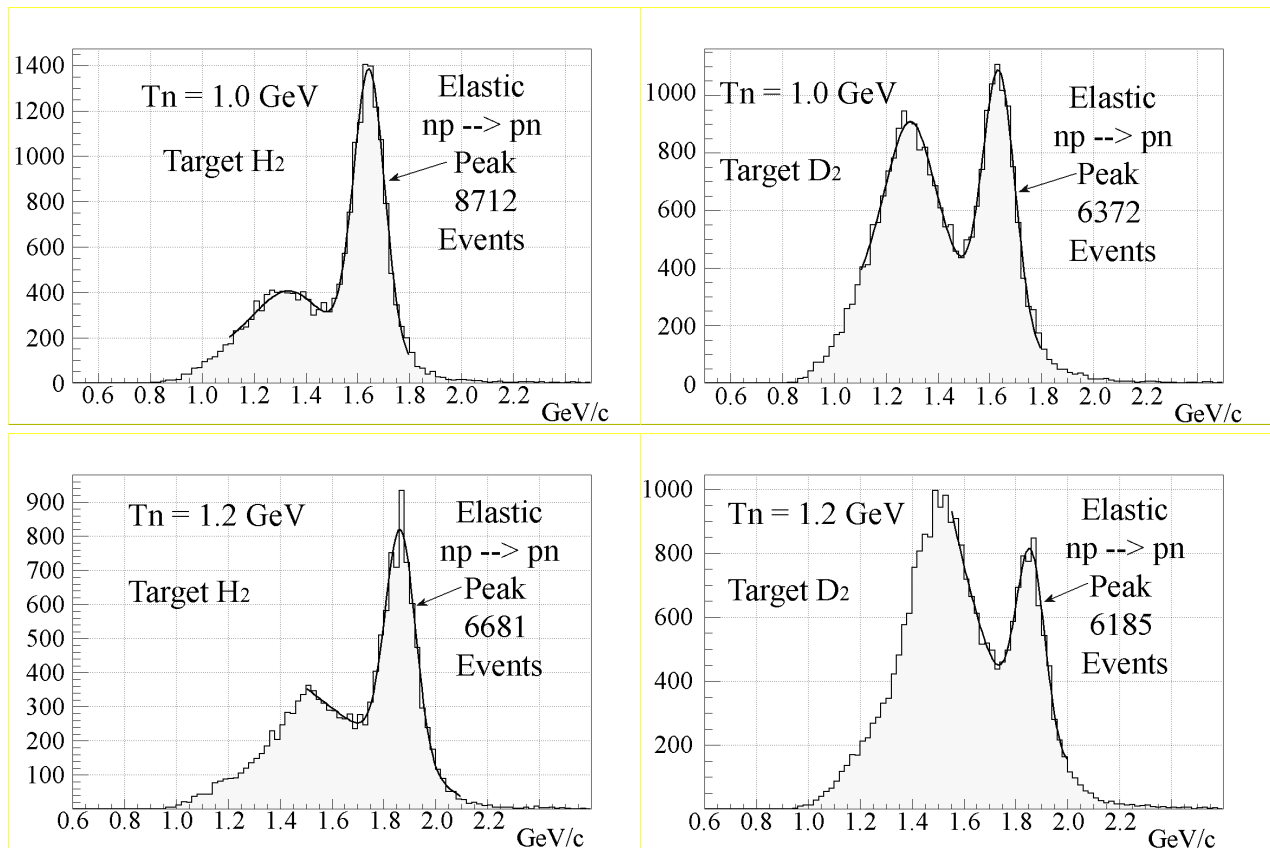
In March the preliminary results on supervision protons from charge-exchange reaction were received

Delta-sigma charge-exchange



Spectrometer Delta - Sigma
(December 2003 - March 2004)

Delta-sigma charge-exchange

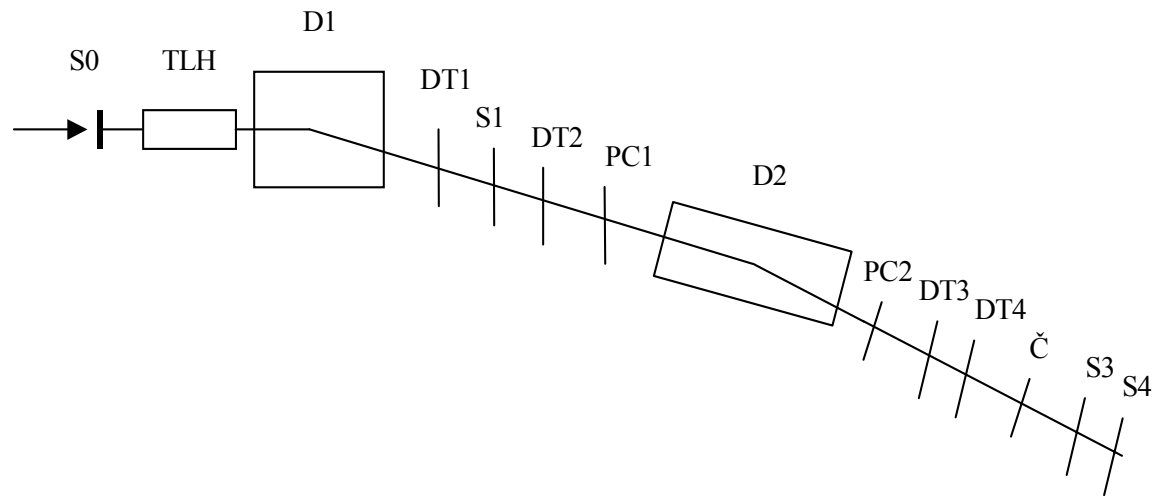


The program of experiments on set-up Strela is aimed at definition of amplitudes $np - pn$ reaction.

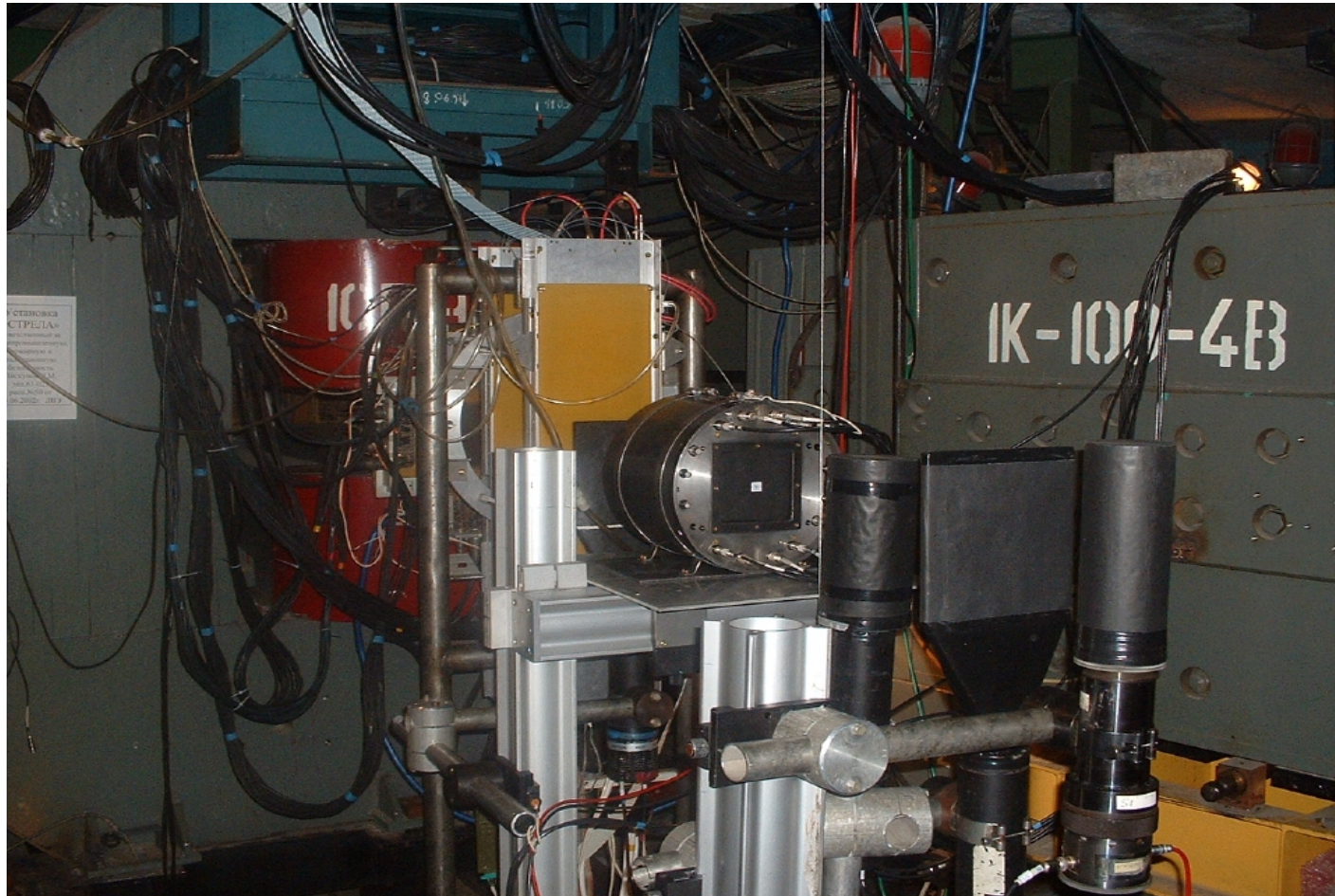
We hope to receive the new data at higher energies, than on COSY (ANKE).

The modern scheme of experiment and its kind is shown on the following slides.

STRELA, March 2004

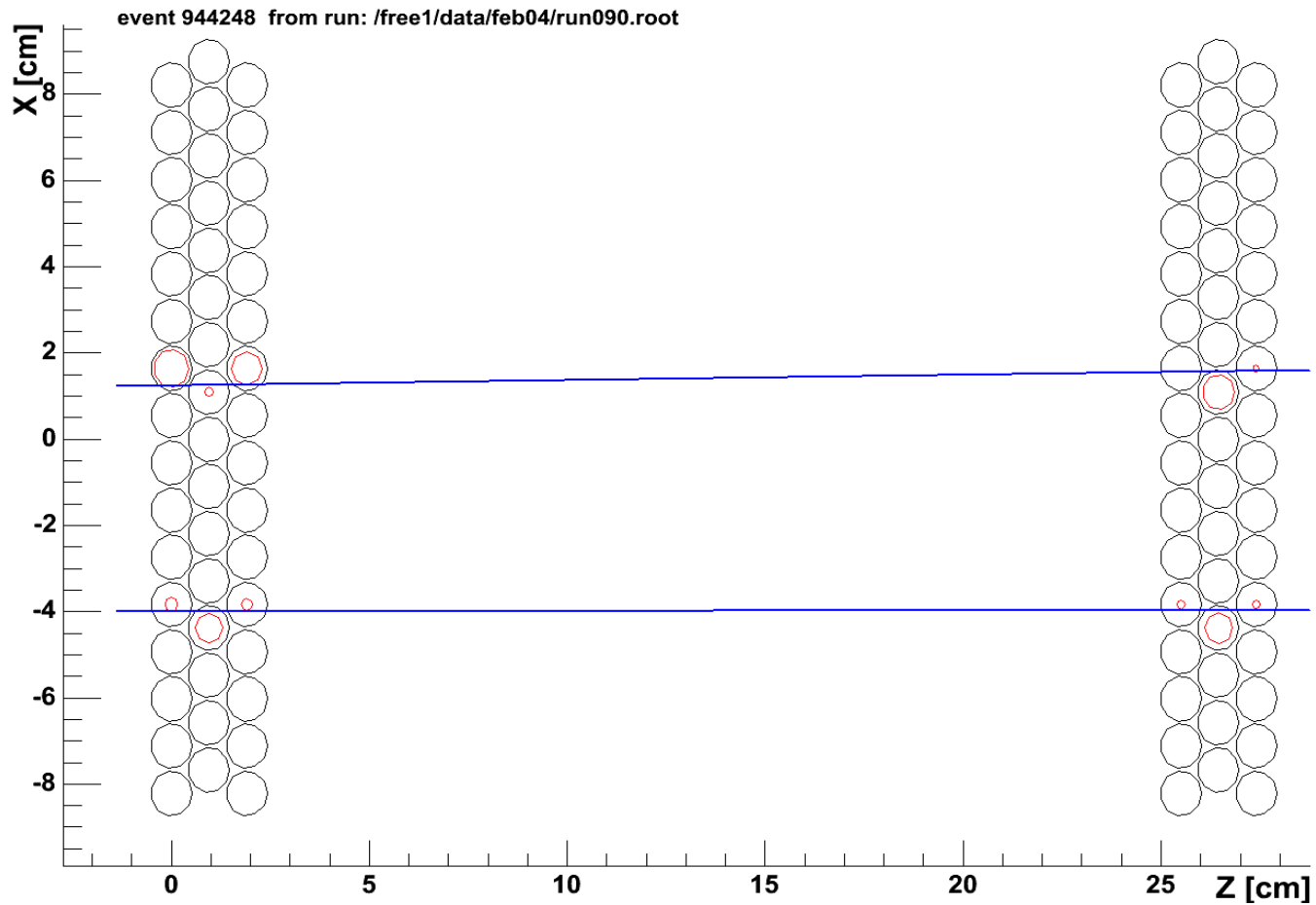


STRELA, March 2004



STRELA, March 2004

Example two tracks of event restored on drift tubes.



ALPOM

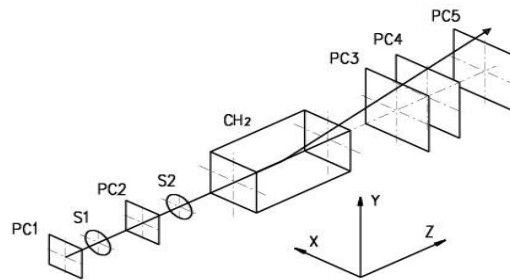
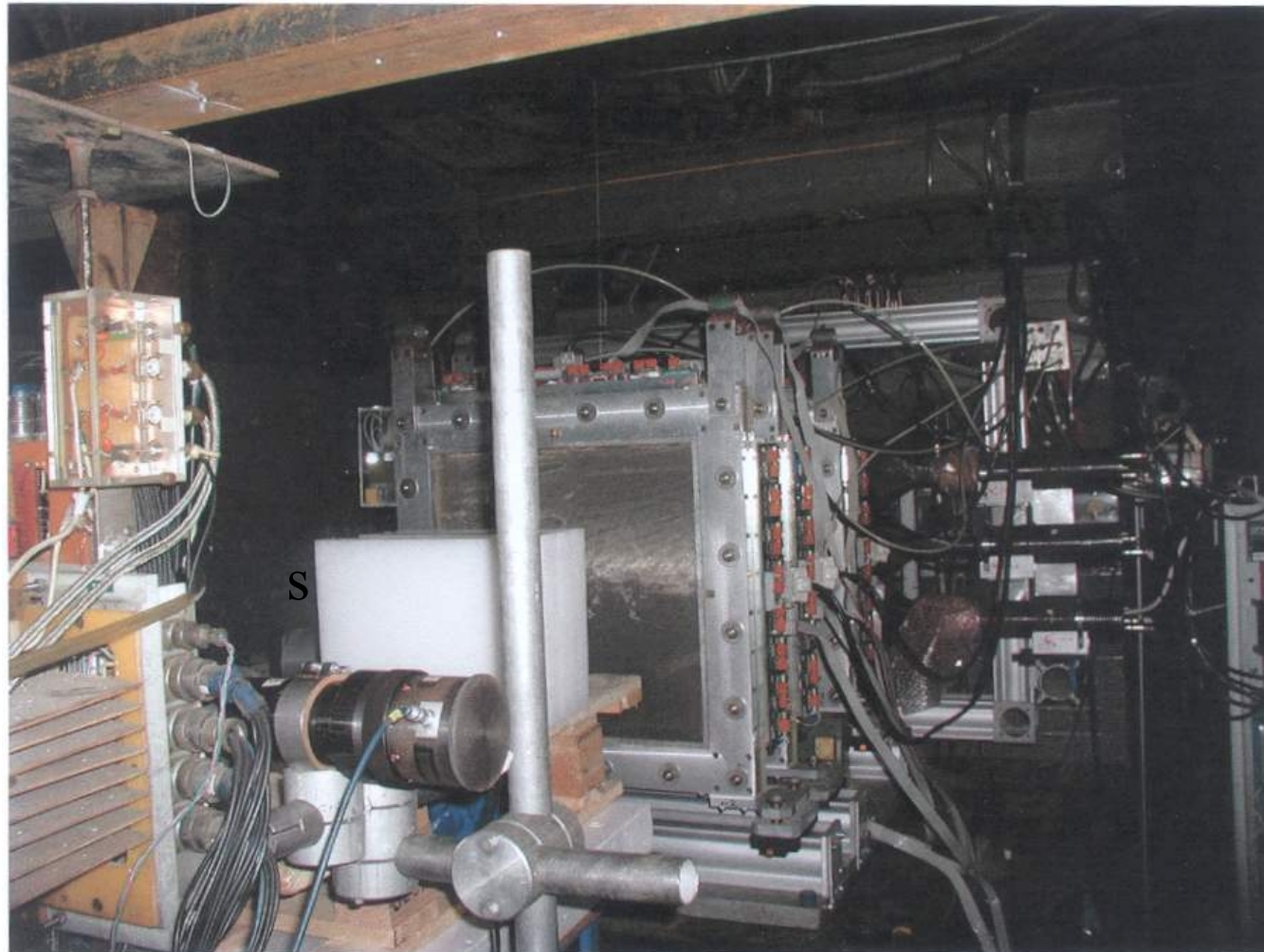


Fig. 1. Schematic view of the setup. S_i – scintillator counters, PC_i – proportional chambers.

The hybrid set-up ALPOM consist of ALpha spectrometer (VBLHE) and POMm polarimeter (SACLAY). Schematic view it detecting system here is shown. Its photo is shown on the following slide.

ALPOM



ALPOM

The knowledge of the analyzing power for $p+CH_2$ reaction to the highest momentum is highly desirable to help planning a new experiments.

We see here new results at four beam momenta, $p_p = 1.75, 3.8, 4.5$ and 5.3 GeV/c, wich extend the data base useful for proton polarimetry.

This work was made together with physycists from SACLAY (France) and JLAB (USA).

ALPOM

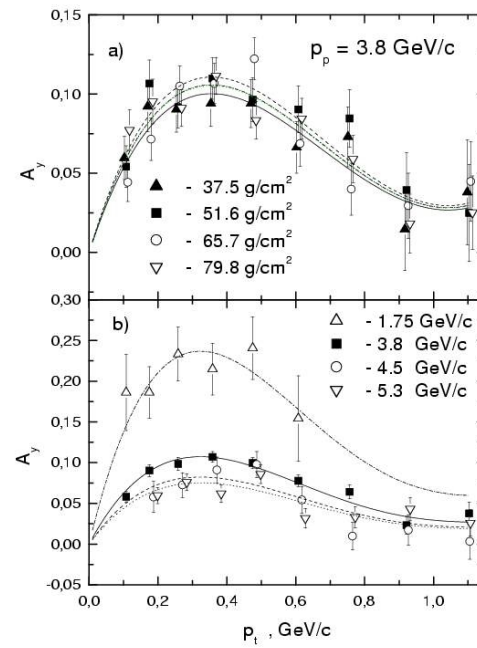


Fig. 4. Analyzing powers as a function of p_t : (a) for different target thicknesses at $p_p = 3.8$ GeV/c; (b) for different momenta at $L = 51.6$ g/cm².

LNS, PHe3

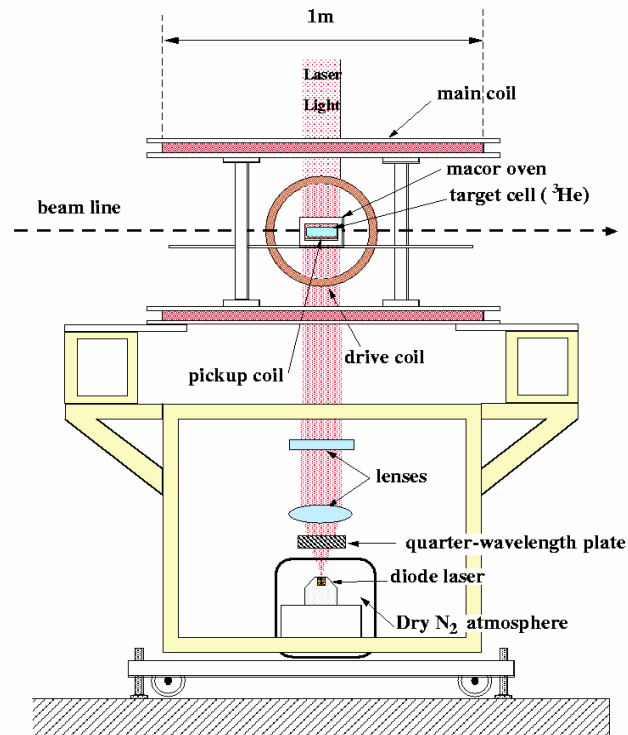
The both LNS and PHe3 experiments are proposed to study the spin structure of the deuteron and three-nucleon forces with the use of the polarized deuteron beam of Nuclotron.

The goal of LNS project is to measure the vector (A_y) and tensor (A_{yy} , A_{xx}) analyzing powers in the dp-elastic scattering and dp-breakup reactions.

LNS, PHe3

The PHe3 project is devoted to the measurements of the tensor analyzing power T_{20} and spin correlation $C_{y,y}$ in the reaction $d^3\text{He}-p^4\text{He}$ at deuteron energies between 1.0 and 1.75 GeV using polarized deuteron beam of Nuclotron and unpolarized and polarized ^3He targets developed in Japan.

LNS, PHe3



The spin-exchange type polarized ³He target .
Now is produced in Japan (RIKEN).

CONCLUSION

Thus, in VBLHE JINR
the wide program of
polarizing researches
exists and develops.