

# LINC2008

## Summary

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Protvino  
20.06.08

# Light ions in U-70

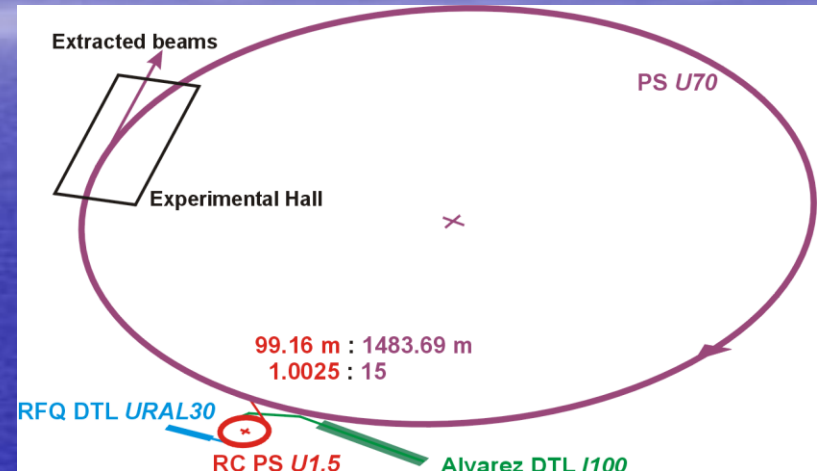
Beam intensities

Ions	$N_{B0}$	$qN_{B0}$	weight
proton $p$	$2-9 \cdot 10^{11}$	$2-9 \cdot 10^{11}$	1
deuteron $d$	$1 \cdot 10^{11}$	$1 \cdot 10^{11}$	10
carbon ${}_{12}\text{C}^{6+}$	$3 \cdot 10^9$	$2 \cdot 10^{10}$	50



In-out sensitivity of  
beam diagnostics

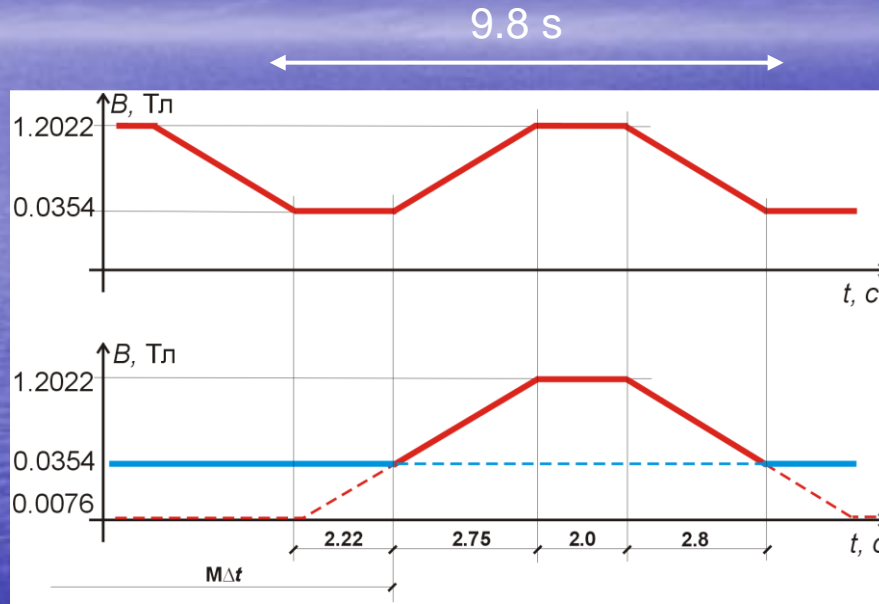
+  
Vacuum system (MCS, ionization losses)  
WP, resonances and dynamic aperture  
...



# Accelerator, 34 GeV/u

Conventional cycle,  
 $M = 1-3$

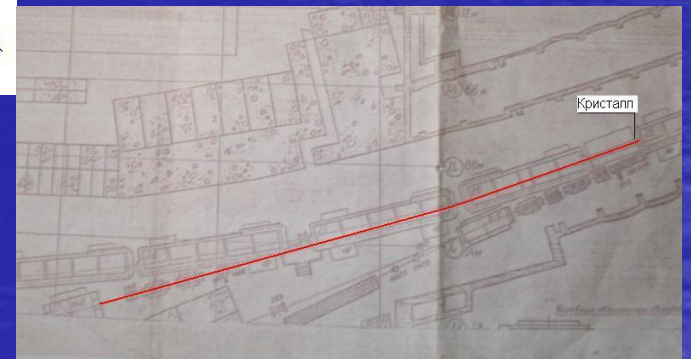
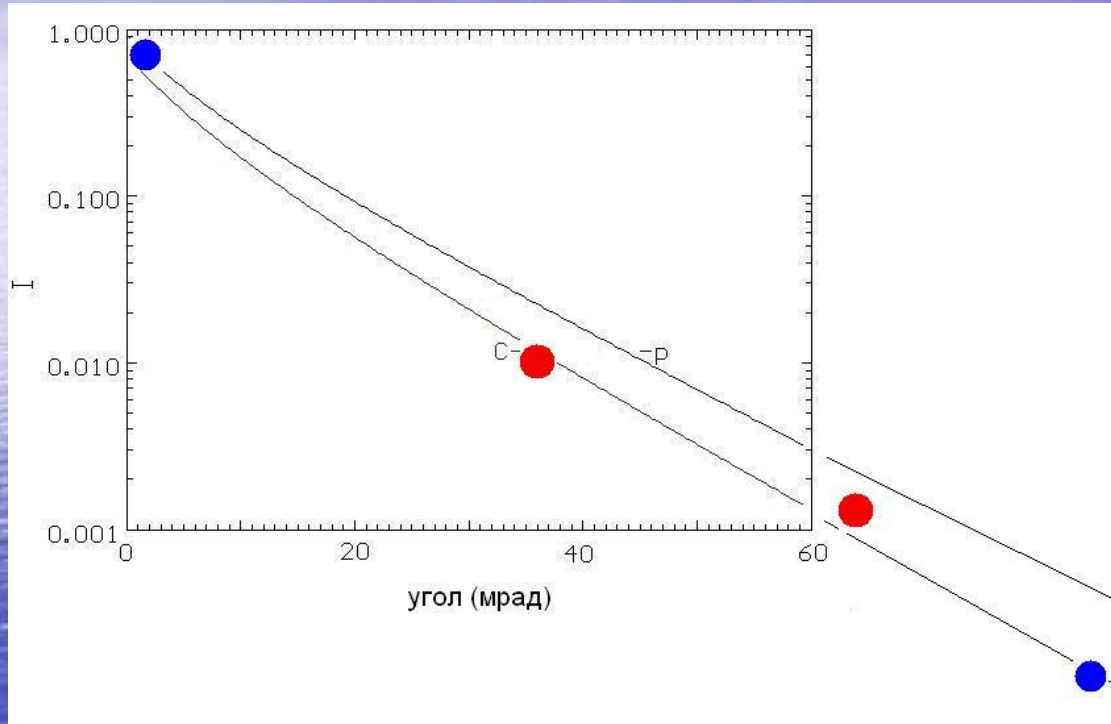
Extended cycle,  
max  $M = 29$



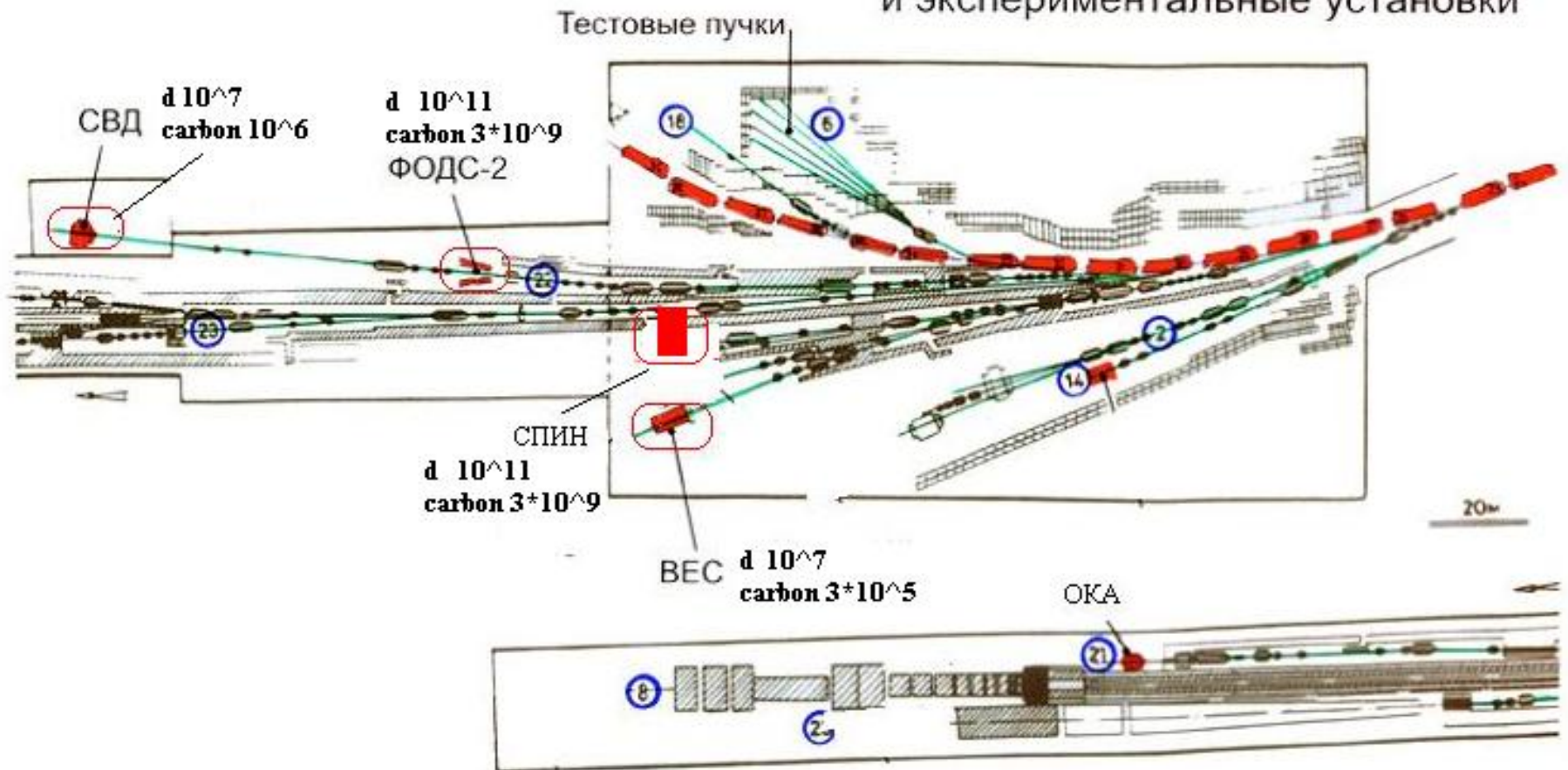
Cycle rep period:  
 $T_{U70} = M \cdot \Delta t + 7.6 \text{ s}$



# Slow extraction by septum and extraction by bent crystals

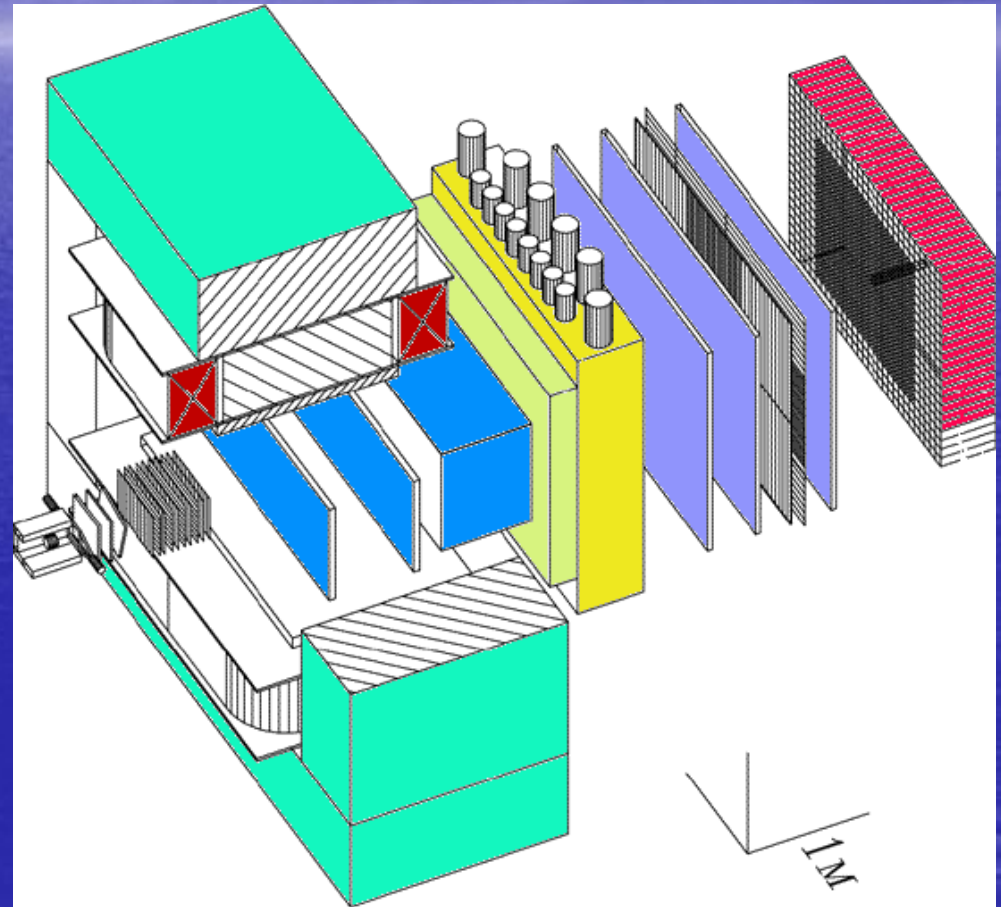


# Каналы частиц У-70 и экспериментальные установки



## Meson spectroscopy

VES (IHEP)

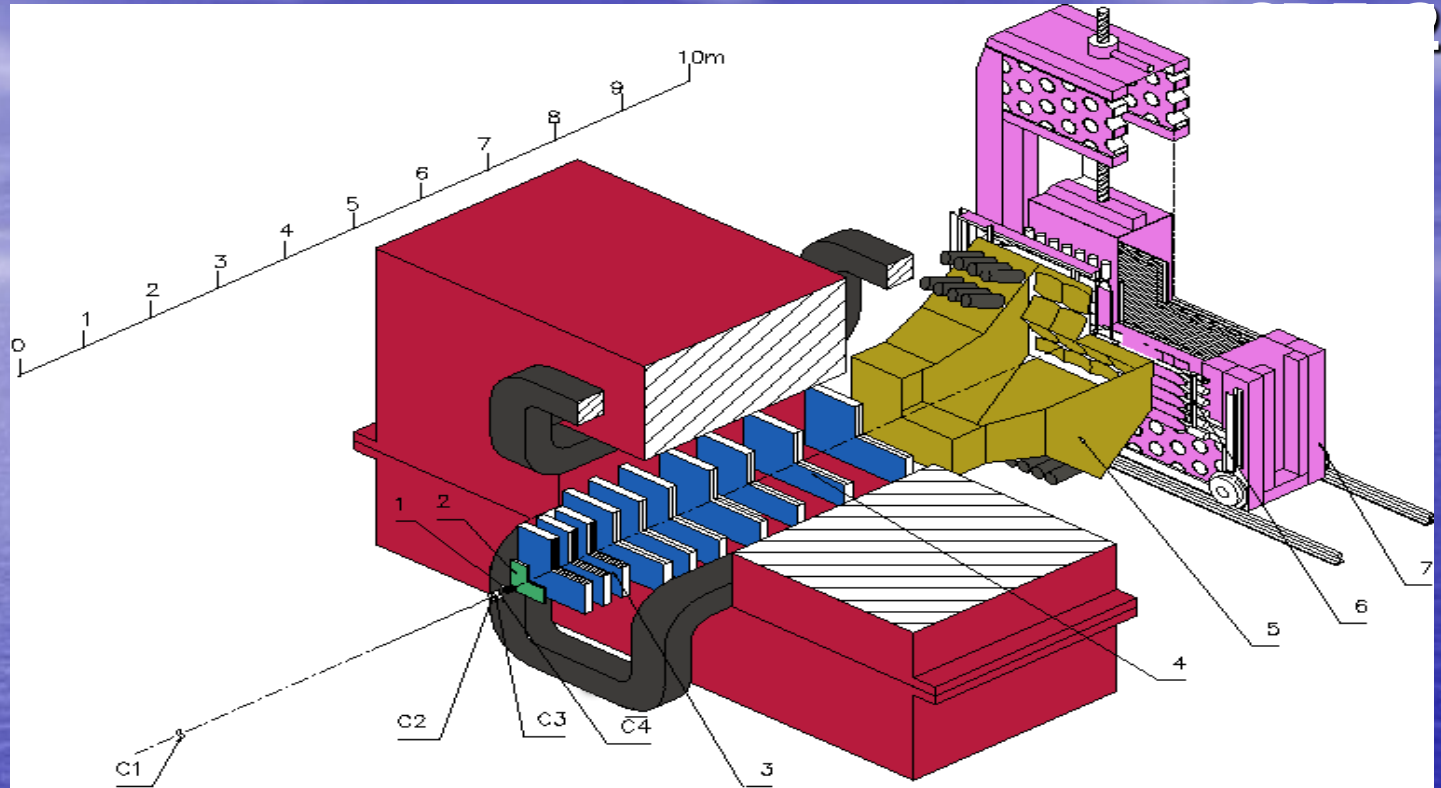


VES layout



# Экспериментальная установка

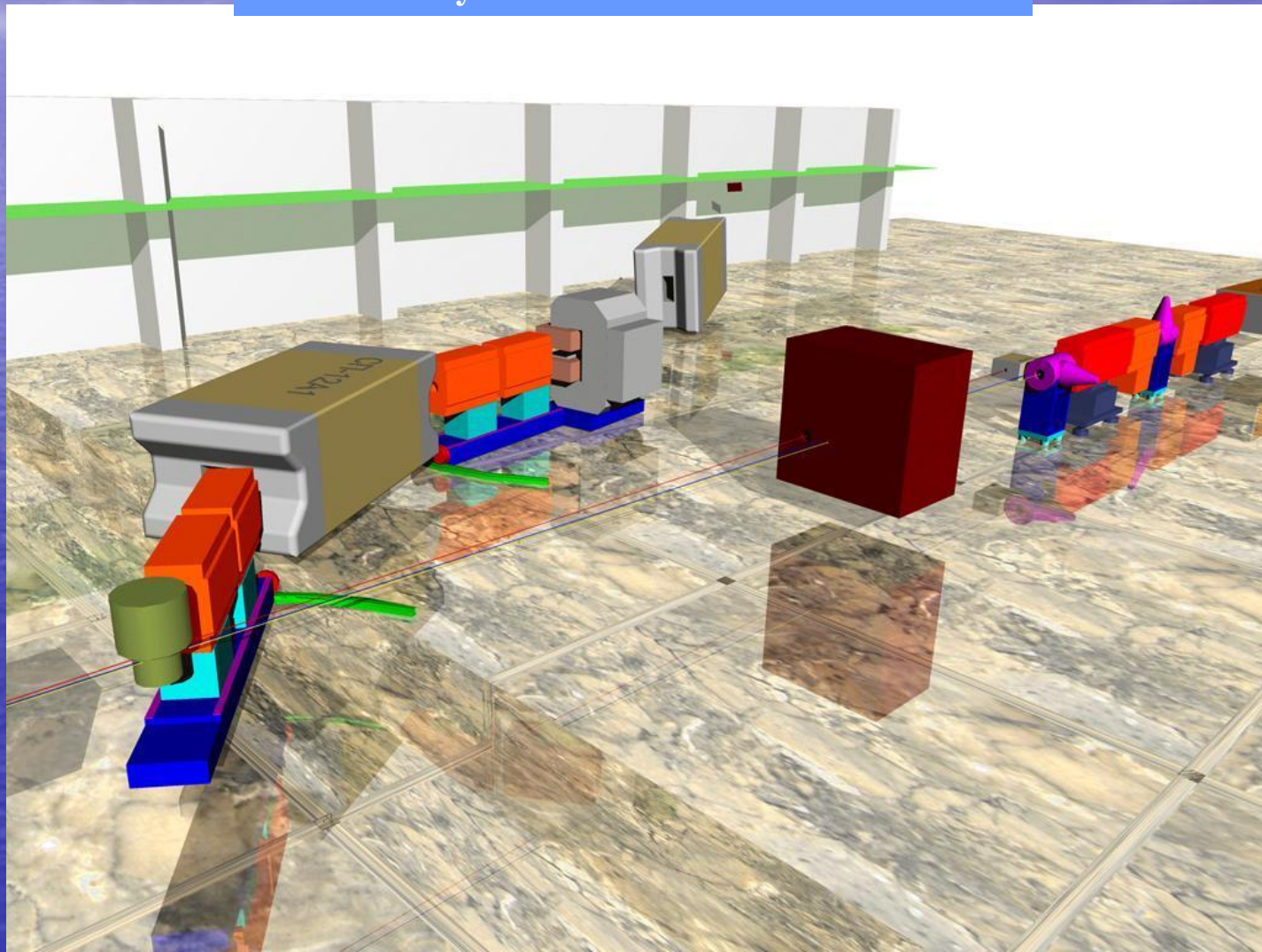
SVD



## ● Рис.1 Схема установки

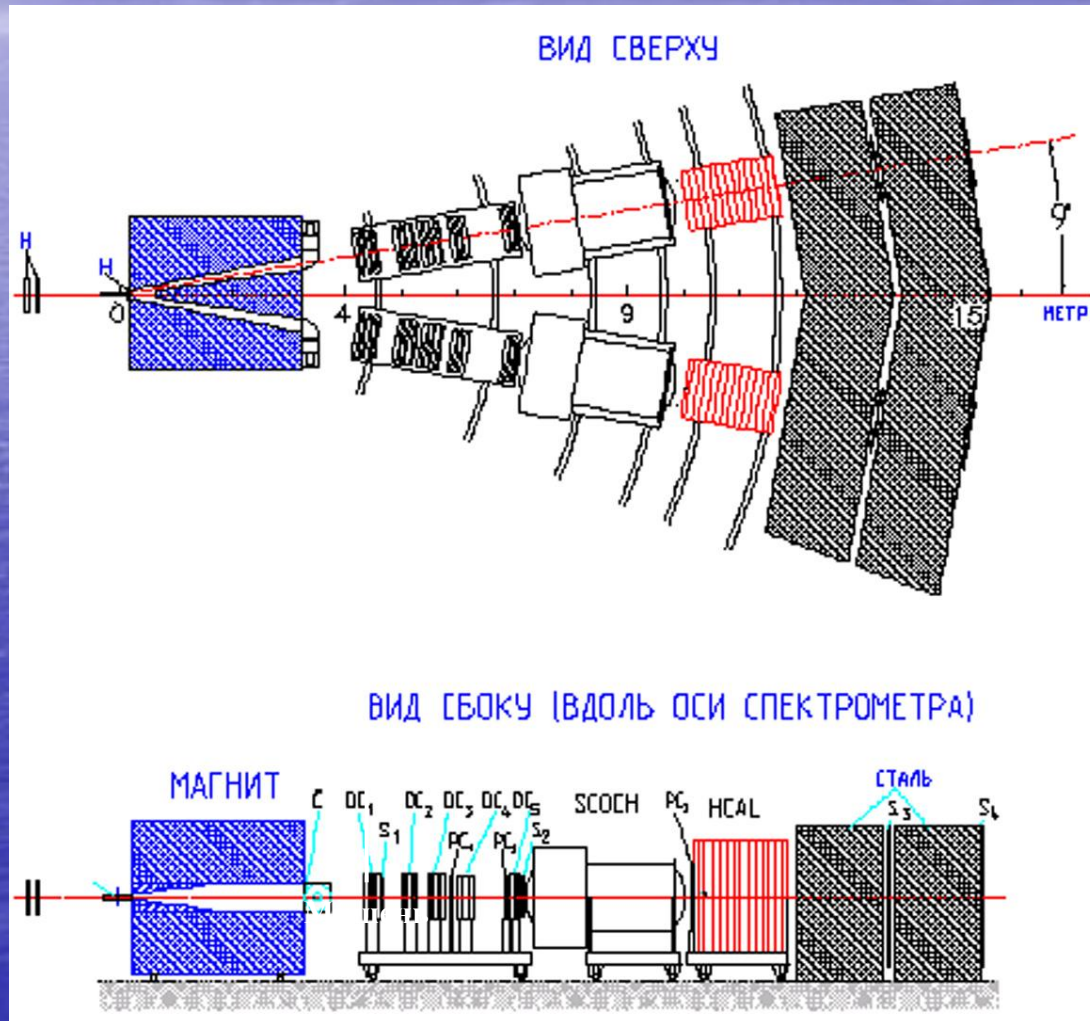
- C1, C2 – пучковый стинциляционный и Si-гodoskop;
- C3, C4 – мишенная станция и вершинный Si-детектор (AM и ВД);
- 1, 2, 3 – трековый детектор на минидрейфовых трубках (МД);
- 4 – пропорциональные камеры магнитного спектрометра (МС);
- 5 – пороговый черенковский счётчик (ЧС);
- 6 – стинциляционный гodoskop (СГ);
- 7 – детектор гамма-квантов (ДЕГА)

## Schematic layout of SPIN@U70





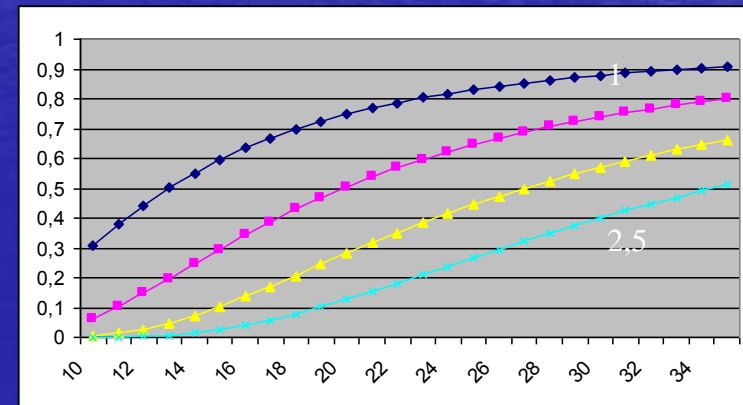
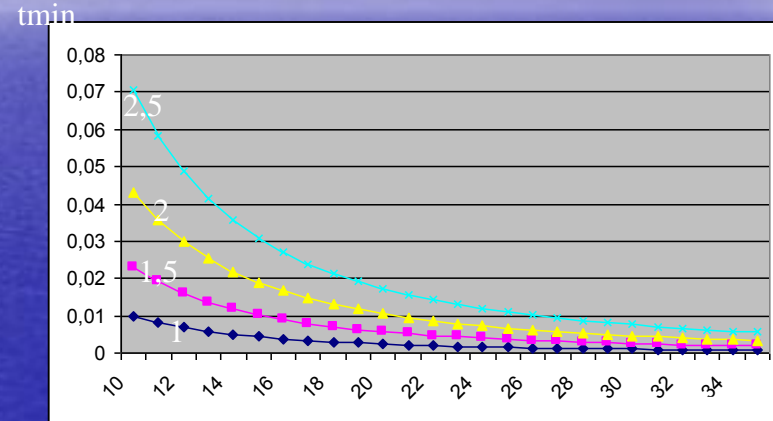
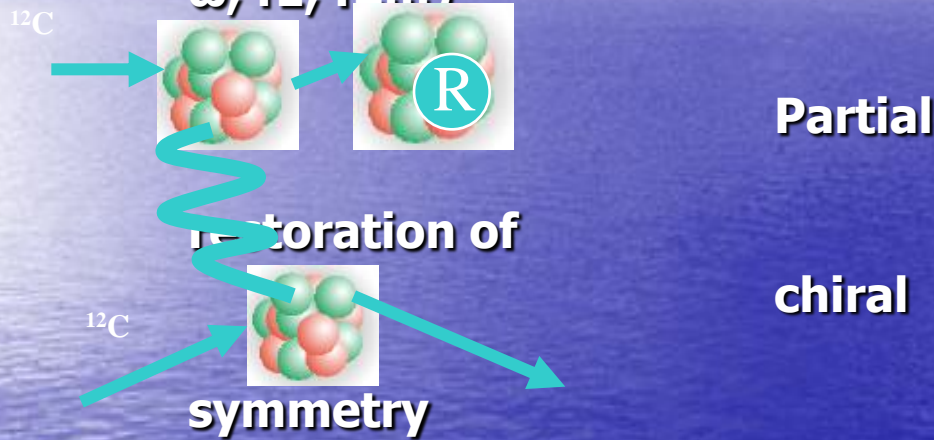
## FODS-2 Layout



# VES

## Mesonic resonances in carbon in "backward" kinematics

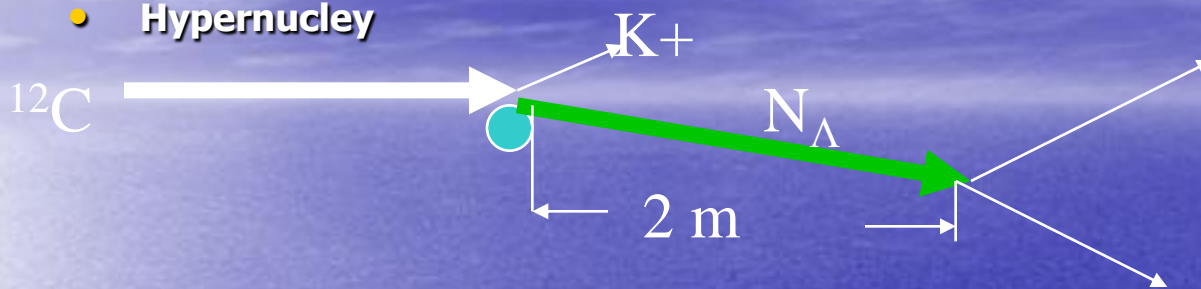
- $^{12}\text{C} + ^{12}\text{C} \rightarrow ^{12}\text{C} + ^{12}\text{CX}$  ( $X = \sigma, f_0, \omega, f_1, f_2, \dots$ )





# VES

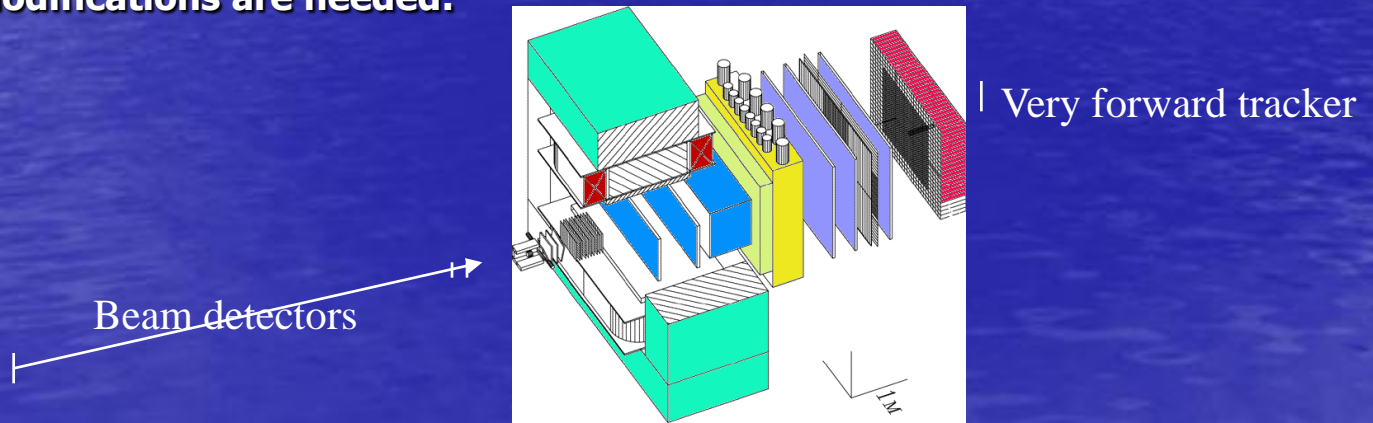
- **Hypernuclei**



- **Colored nucleons**



- **Minor modifications are needed:**





# SVD

- Energy dependence of inclusive  $\pi^0$ ,  $\eta$ ,  $\omega$ ,  $f_2$ ,  $K^0$  ... in carbon  $A \rightarrow X$   
(as suggested by Sadovskiy and Kharlov)

Without tracking

Magnet on – magnet off

- SVD vs Hyperon

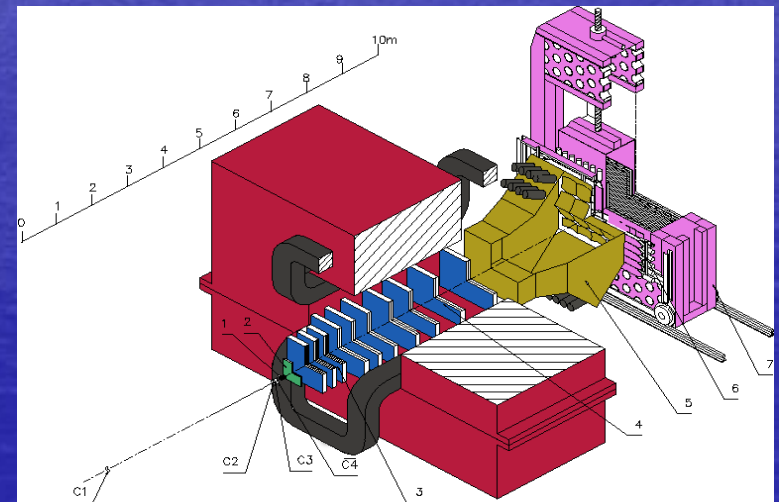
High granularity of lead glass spectrometer

Fast DAQ

Good beam

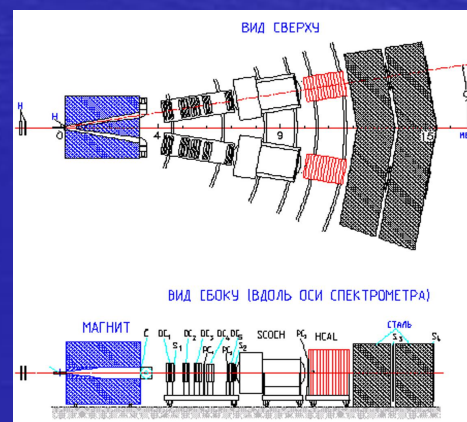
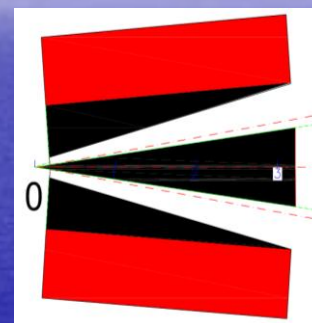
Big team

- In more distant future – reconstruction of min bias



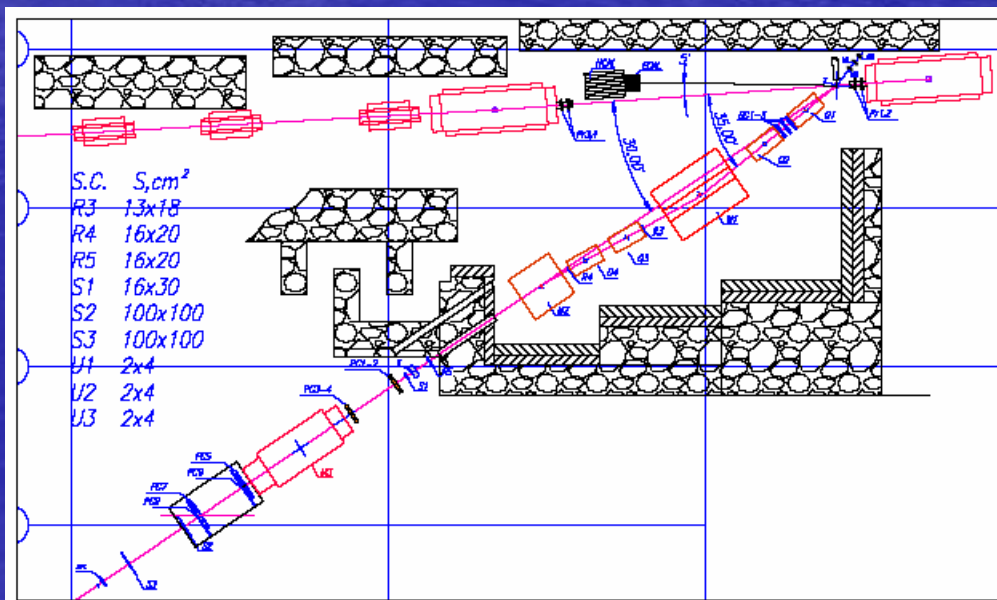
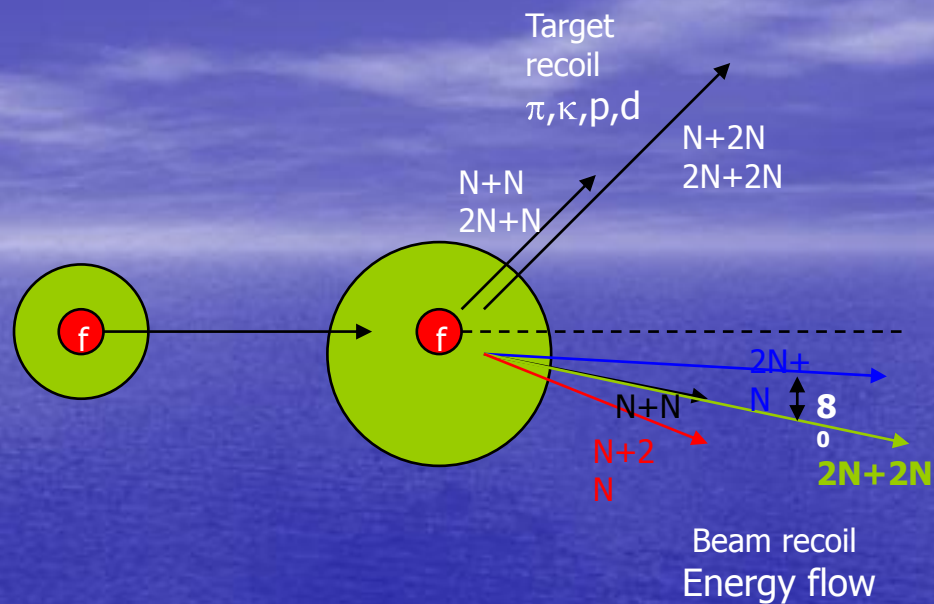
# FODS

- study high  $xT$  processes in  $pp$ -,  $pA$ - и  $AA$ -interactions
- We propose to measure the process with hydrogen and nuclei targets to study the effects of nuclei transparency.
- Cross section of the elastic scattering  $d\sigma/dt$  at  $90^\circ$  in c.m.s. for 30 GeV protons is about  $\sim 10$ - $10$  mb/(GeV/c) $^2$
- Total number of collected events for 30 day exposure for hydrogen target, 0.05  $\lambda_{int}$  length and beam intensity  $10^9$  ppp will be  $\sim 1500$ .
- For nuclear targets the number of events will be  $\approx A$  times larger.





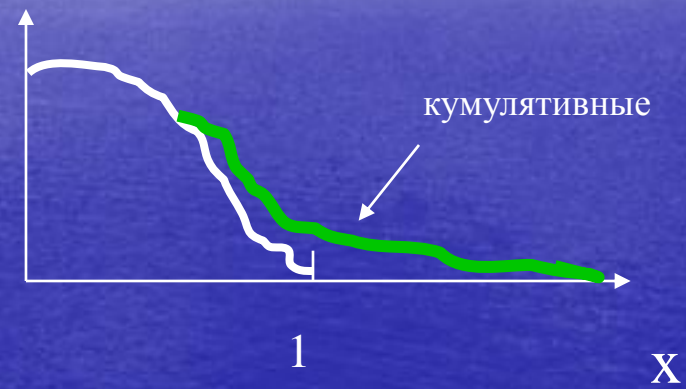
# SPIN





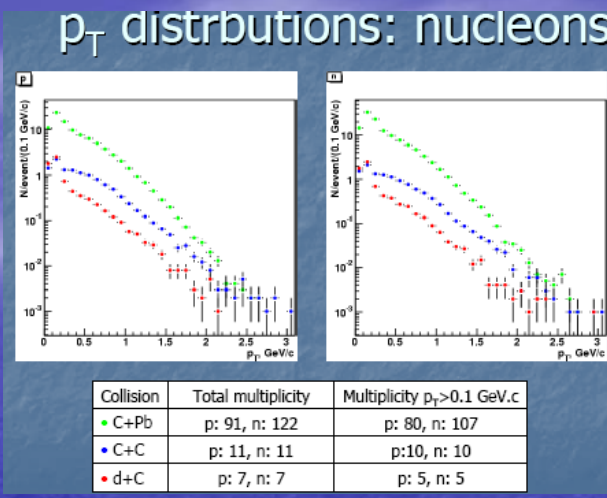
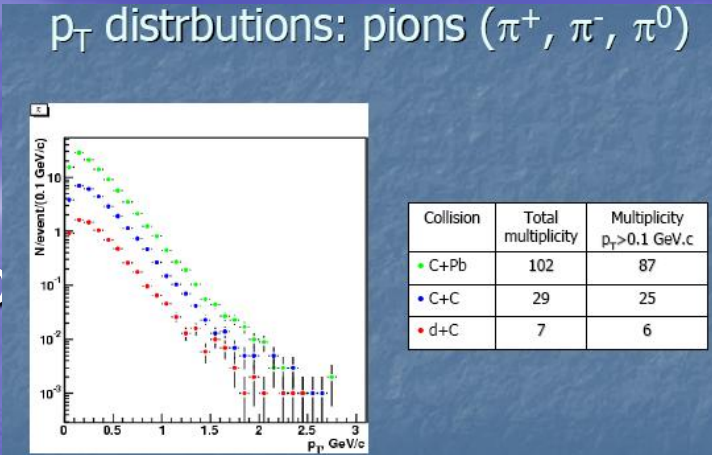
# Channel 22 for cumulative reactions at $0^0$

- Thin  $dE/dx$
- TOF
- Cerenkov
- $X=3 \rightarrow 210 \text{ GeV}$
- $\rightarrow E_{in} = 1/3 E_{max}$



# What else

- Full reconstructio



- Dedicated facility for fragments study

