



ЛМНС в 2003 году

Отчет заведующего
лабораторией



Содержание

- ∅ Основные результаты 2003
 - ∅ Планы на ближайшее будущее
 - ∅ Участие в новых экспериментах
 - ∅ Состав Лаборатории
 - ∅ Финансы
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Влияние ядерной среды на параметры РН амплитуды

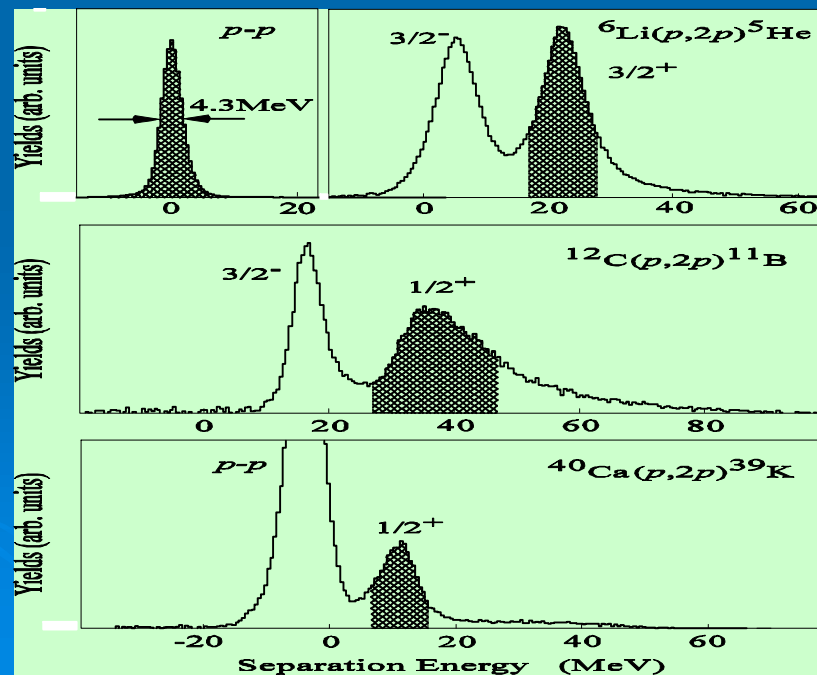
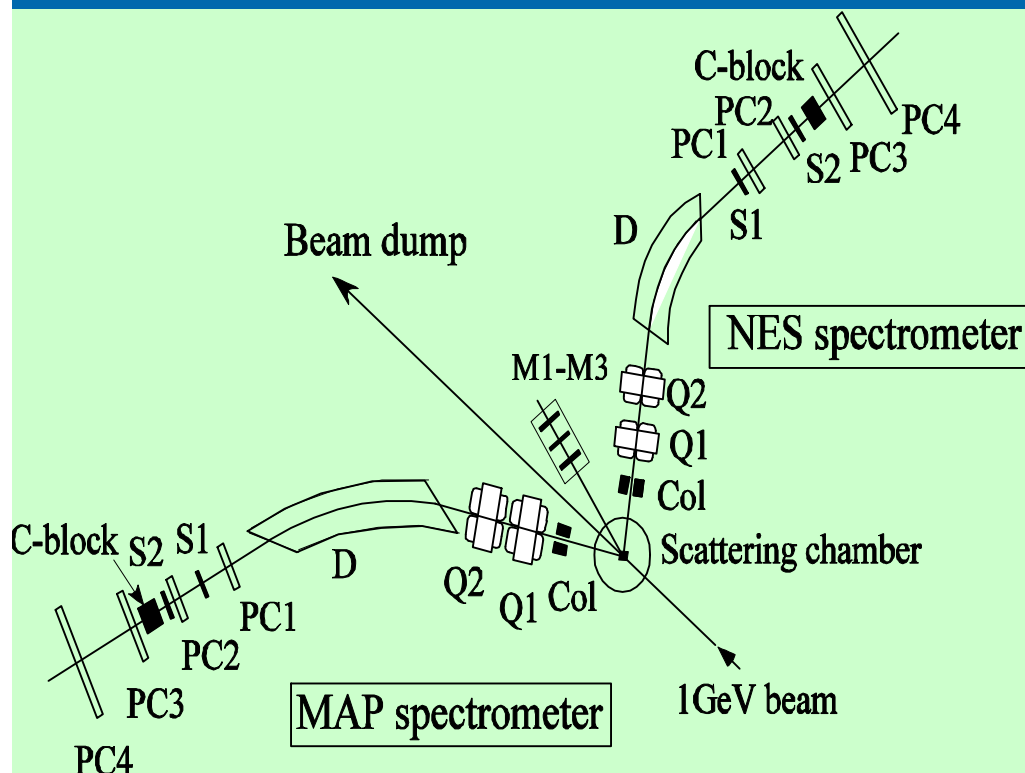
- Разработана и испытана He мишень (совм. ОКСТ) 2003
- Новая электроника считывания с проп. камер (ОРЭ) 2003-2004

He4 сеанс в марте 2004

$$P \Rightarrow P_1(MAP) + P_2(NES)$$

both polarizations

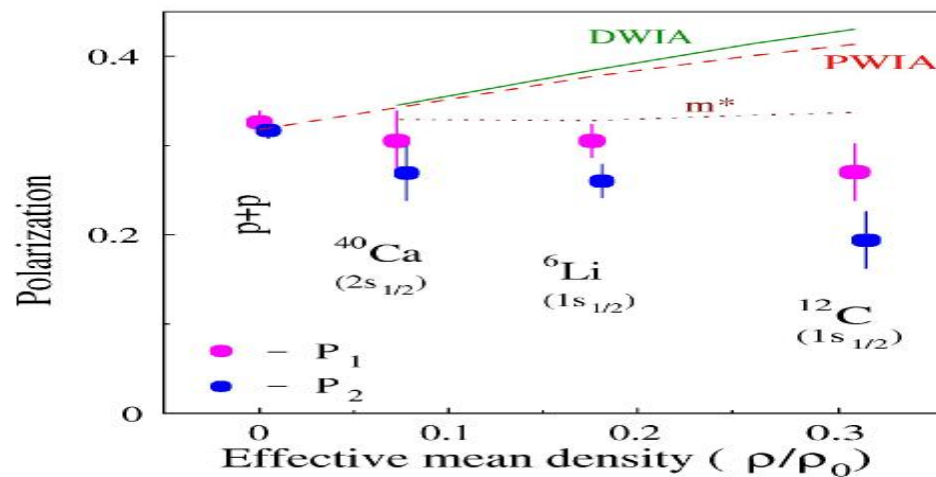
measured



Результаты (принято Phys Rev 2003)

Improved statistics data.

Relativistic effects in pp amplitude are ONLY taken in consideration

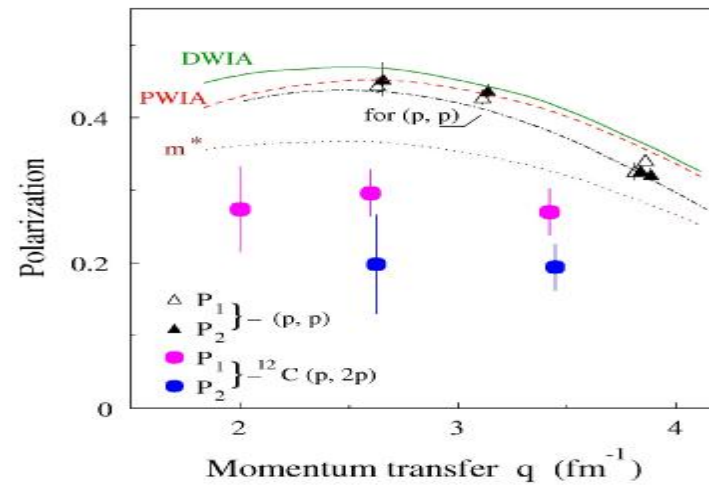


Результаты (принято Phys Rev 2003)

$k_{nucl} \approx 0$ *kinematics*

$$A_{pp} \sim \sum \frac{1}{q^2 + \tilde{m}_i^2} \cdot a_i(q)$$

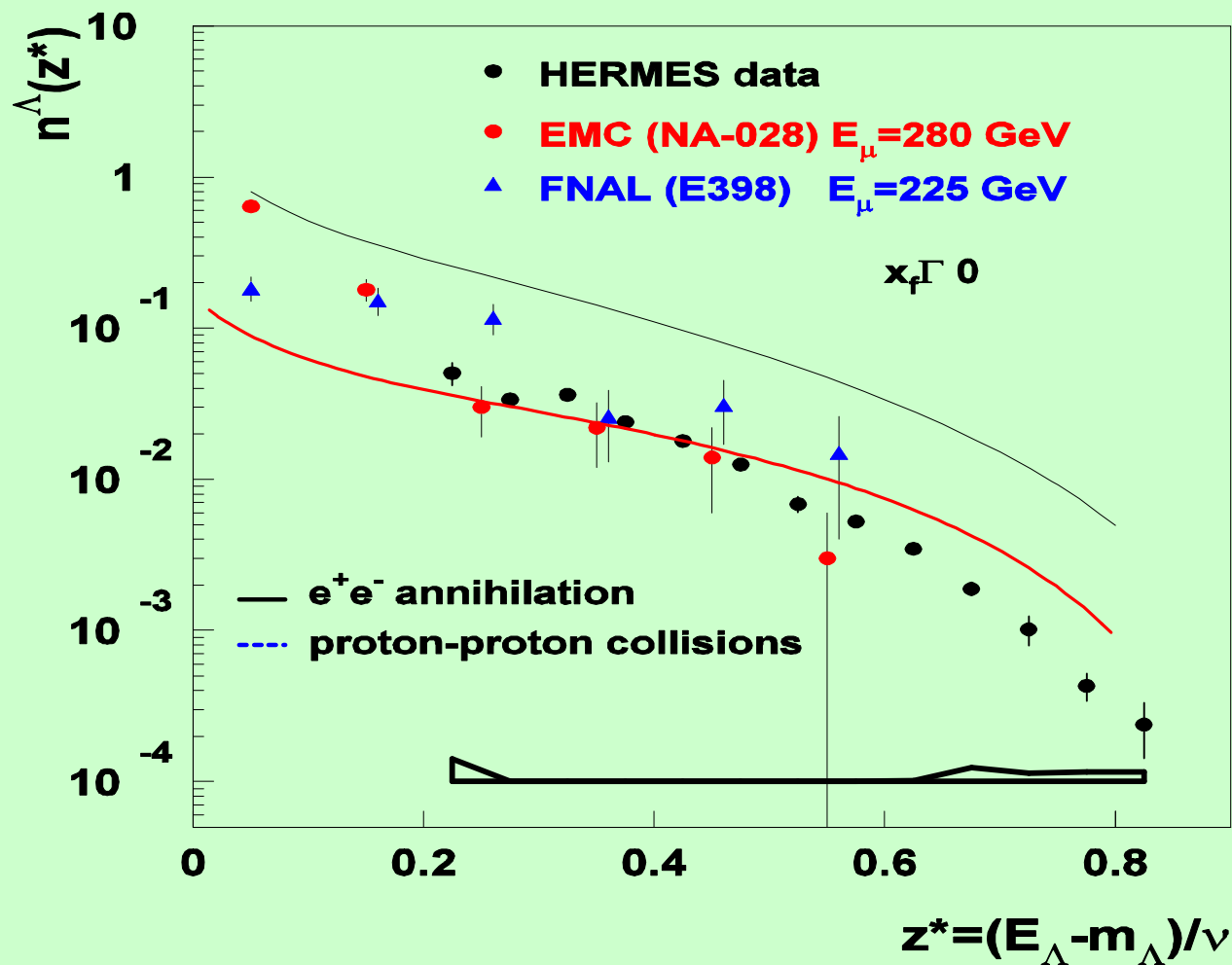
Detailed theoretical analysis is coming



Results from HERMES (PNPI group contribution)

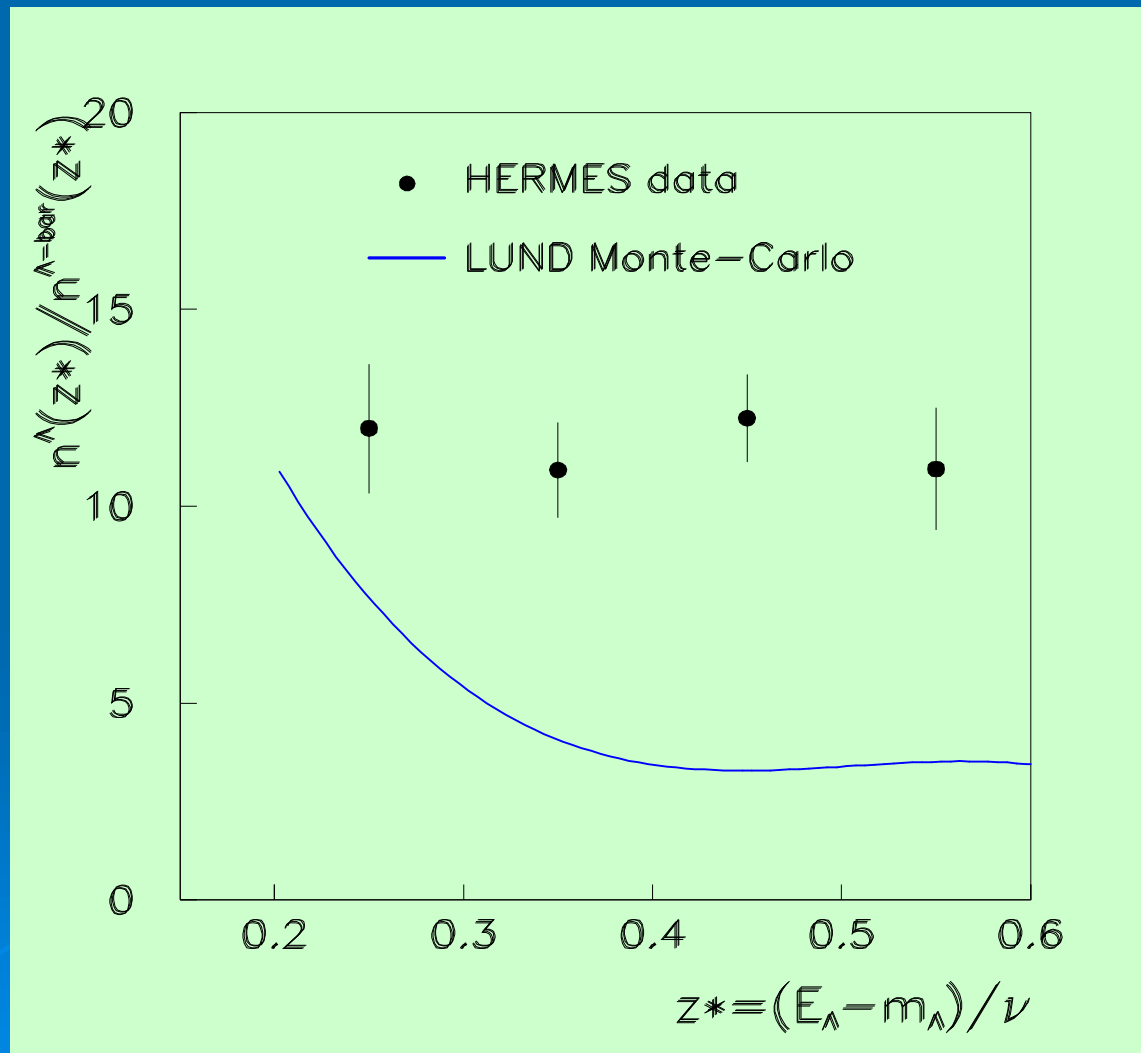
- ∅ Unpolarized Λ and anti Λ production in DIS, ratio Λ to anti Λ (in progress)
- ∅ P_T as function of z in DIS (in progress)
- ∅ Hyperon production , Λ_c (released, in progress)
- ∅ Pentaquark at HERMES (submitted for publication)
- ∅ New Hermes (Track) Reconstruction Program

Λ multiplicity distribution (96-00 data)

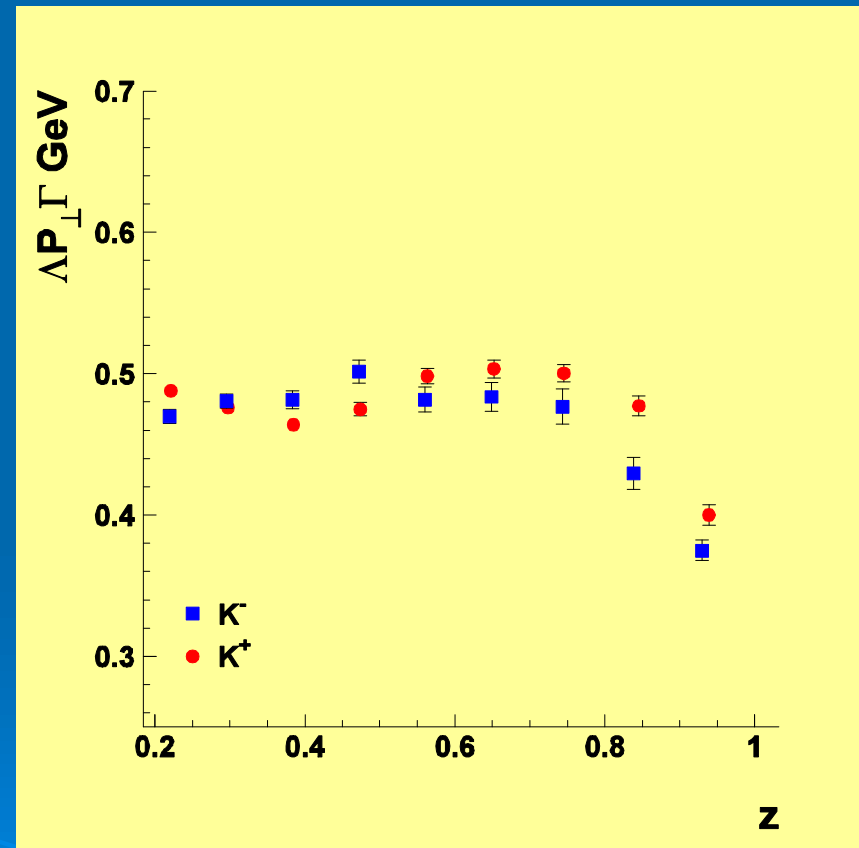
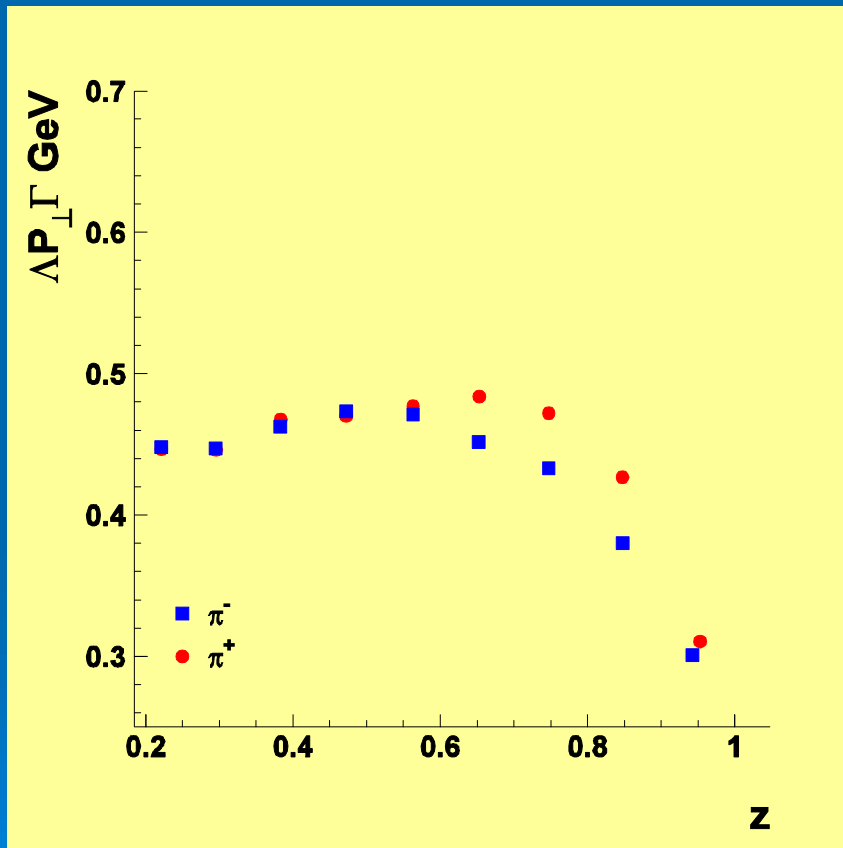


Lambda to antiLambda ratio (2003)

Independent cross check is needed \Rightarrow to be presented at DIS 2004

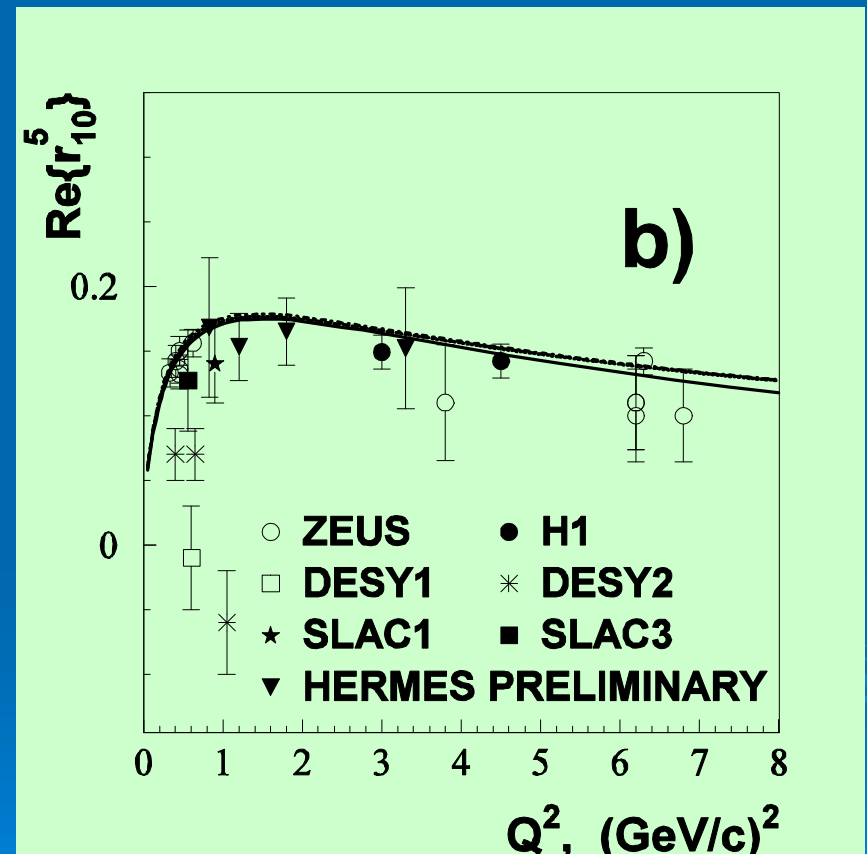
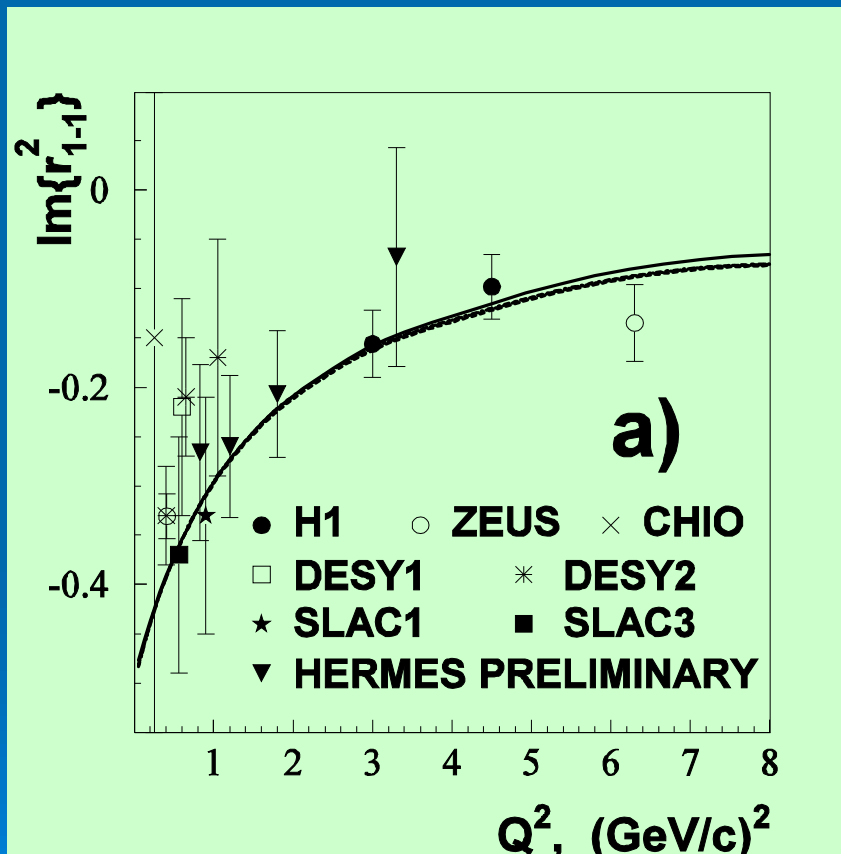


$P_T(Z)$ dependence, transverse quark motion



Problems: rho decay contribution, careful Monte carlo

Rho production in Regge approach

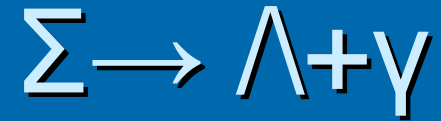


Hyperons at HERMES

Presented
at
DIS 2003

Hyperon statistics (96-00)

Hyperon	Yield	anti-Hyperon	Yield
Λ^0	480000	$\bar{\Lambda}^0$	70000
Σ^0	19000	$\bar{\Sigma}^0$	5200
Ξ^-	2500	$\bar{\Xi}^+$	650
Σ^{*+}	5700	$\bar{\Sigma}^{*-}$	820
Σ^{*-}	6300	$\bar{\Sigma}^{*+}$	1200
Λ_c^+	200	$\bar{\Lambda}_c^-$	30

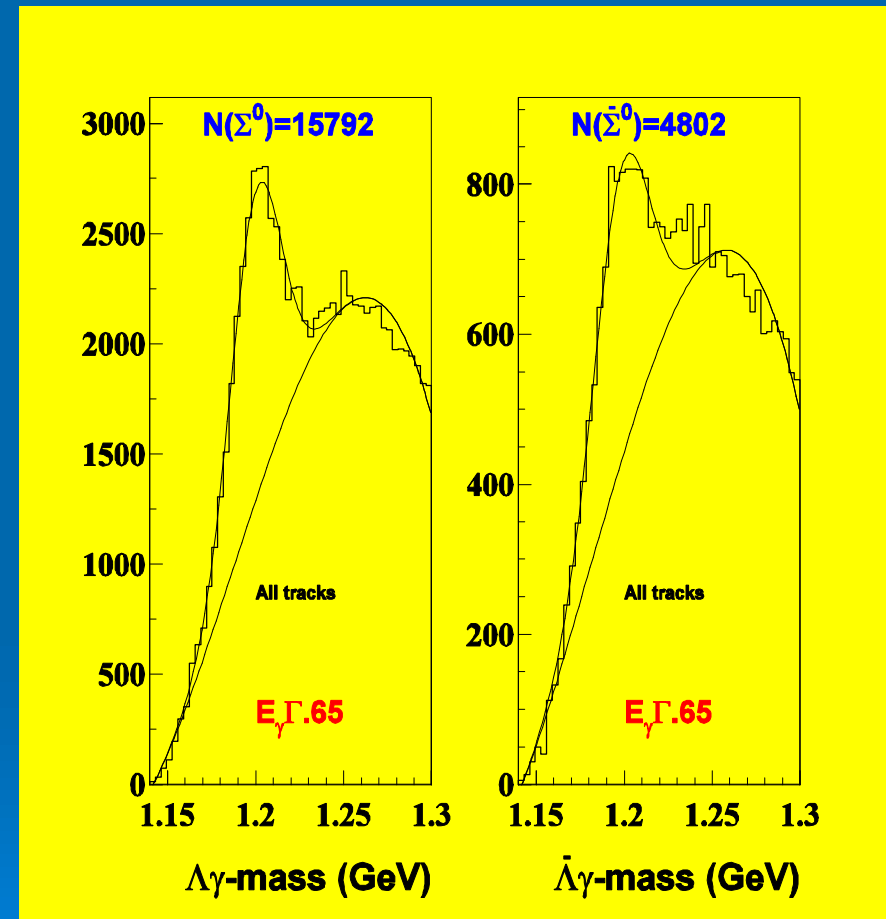


PHYSICS CASE?

$$\Lambda \uparrow = (ud)_0 s \uparrow$$

$$\Sigma \uparrow = (ud)_1 \uparrow s \downarrow$$

Polarization, relative yields,
cross sections
-> hyperon spin structure



Obsevation of Lambda_c

PHYSICS CASE?

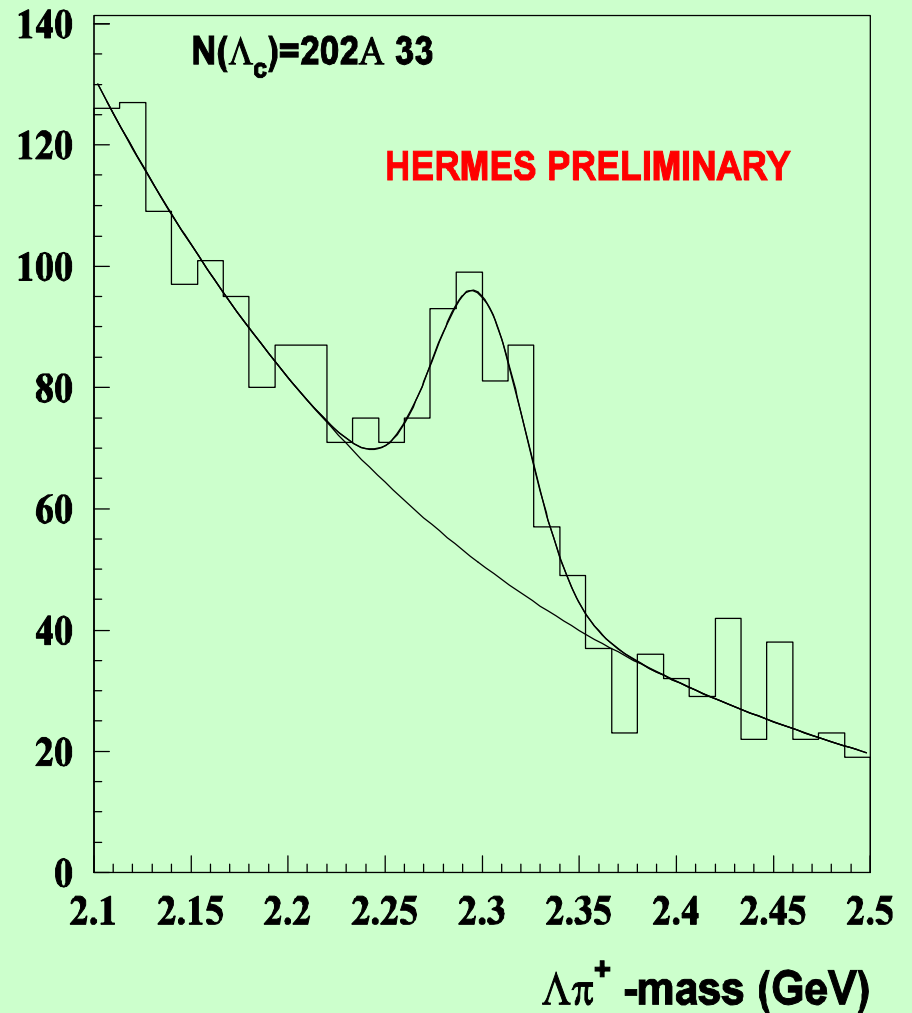
$$\Lambda \uparrow = (ud)_0 s \uparrow$$

$$\Lambda_c \uparrow = (ud)_0 c \uparrow$$

$$g \uparrow \Rightarrow c \uparrow + \bar{c} \uparrow$$

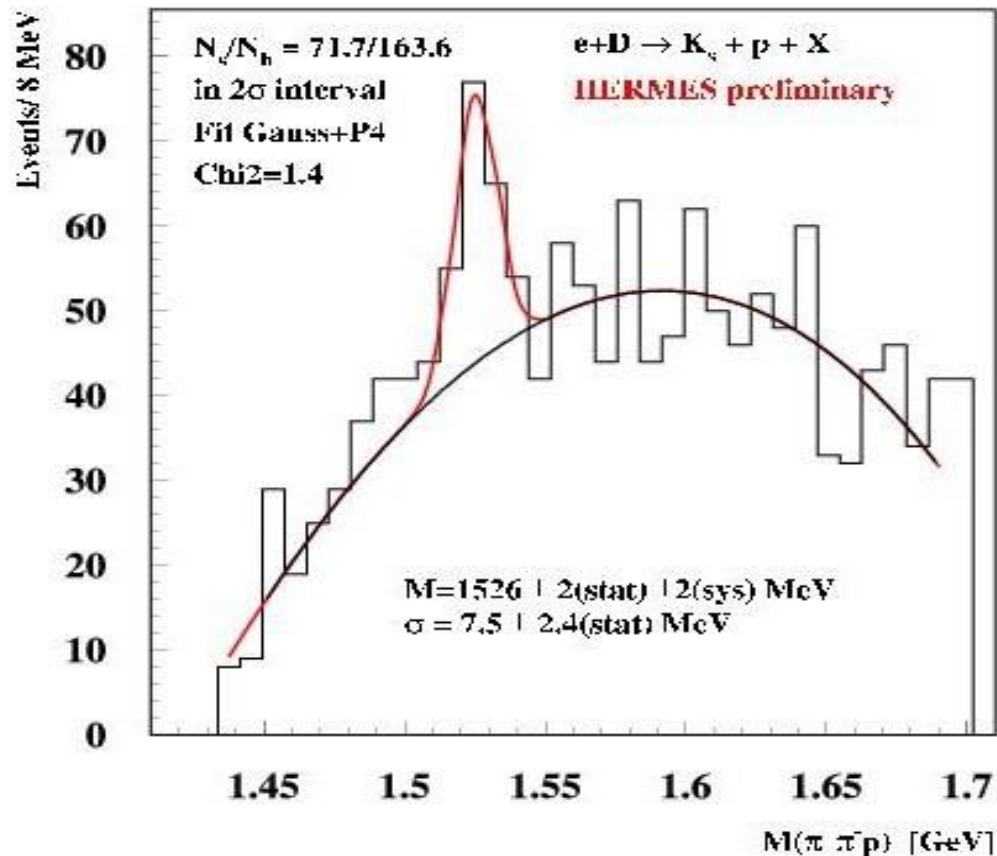
$$g \uparrow + c \uparrow \Rightarrow frag \Rightarrow \Lambda_c$$

Cross section, DSA,
Polarization
->gluon polarization



Penta_q at HERMES

Final Spectrum with Bckg assumption



Background approximated by P4 polynom

HERMES in 2004-2006(7)

Transversely polarized target 2004
⇒ Transversity distributions,
Collins/Sivers functions

RD +LW upgrade 2005-2006(7)
⇒ exclusive reactions, DVCs
⇒ Generalized parton distributions

Hyperon Physics !!

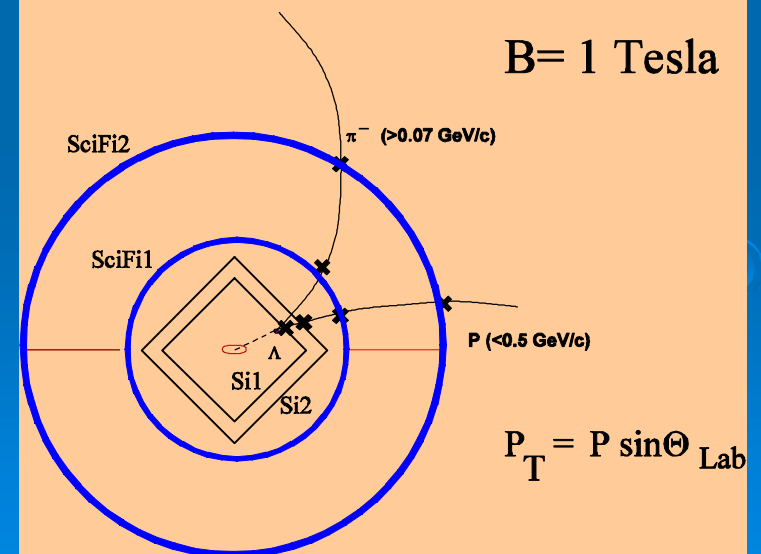
Semi – inclusive Λ production

$N^\Lambda \approx 7500 \text{ per } 10^6 \text{ DIS } e$
(now ≈ 350)

Exclusive

$N^\Lambda \approx 160 \text{ per } 10^6 \text{ DIS } e$

Transverse vertex reconstruction



Participation in new experiments

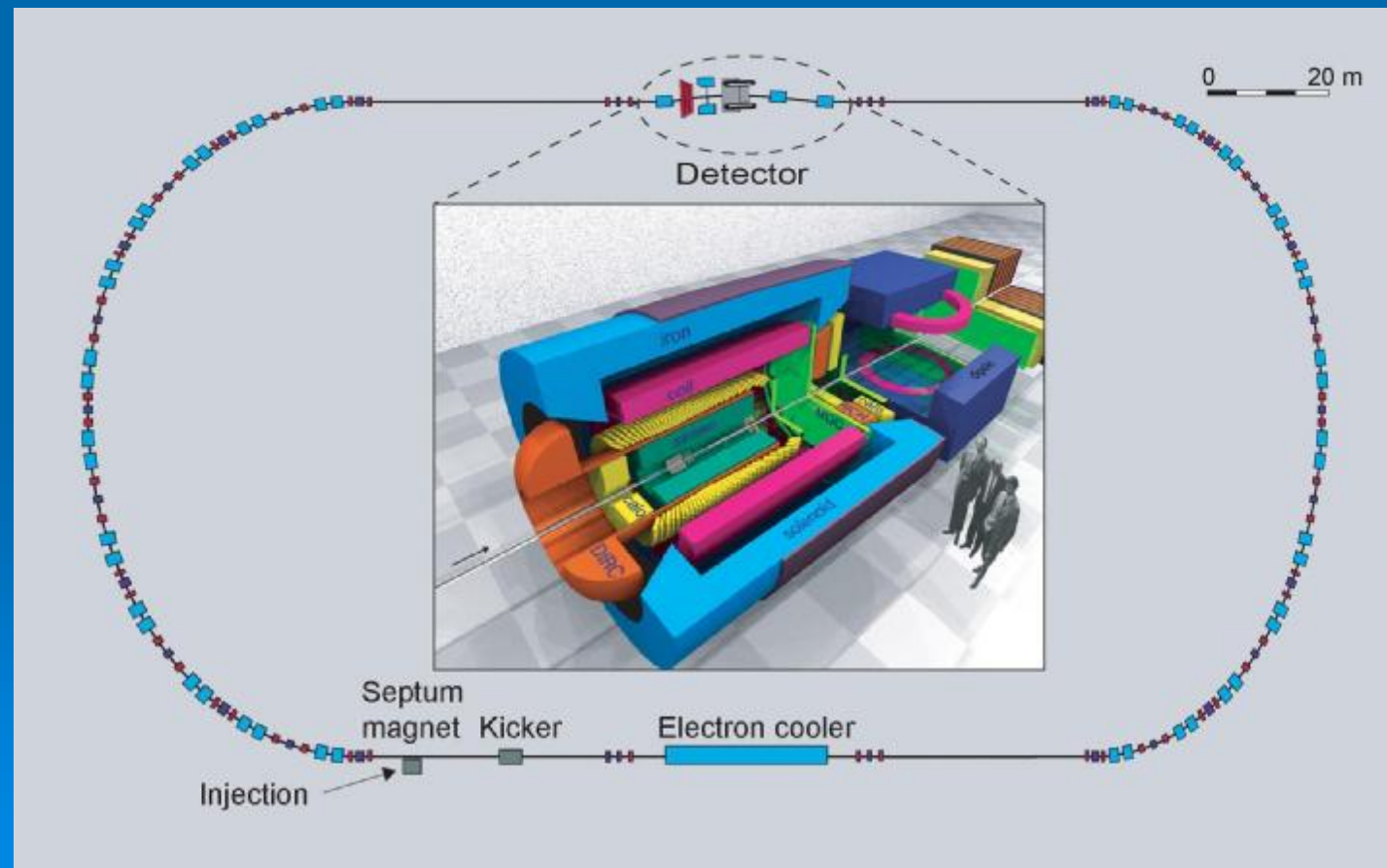
PANDA 15 GeV antiP+P , PAX 15 GeV polarized antiP+ polarized P, GSI ,Darmsstadt

RCNP proposal

TESLA

PANDA (ok)

PAX (ok)



Состав лаборатории

∅ снс(7)+нс(5)+мнс(2)+стажер(2)+инж(1)+
мех(1)+стлаб(1)+завлаб=20 чел

∅ Учен. Степени: доктор(1)+канд(9)

∅ Учен. Звания: проф(1)+снс(7)

Финансы

∅ Российская поддержка

- ФЯФ(Р2Р)+ФЯФ(ГЕРМЕС) 80 Т РУБ
- РФФИ 100 Т РУБ
- АН 600 Т РУБ

∅ DESY только

3 чел по 12 мес =36 (ANL, Colorado,DZ)

66 чел мес (Миннауки + DESY)

**XI International Workshop on Deep Inelastic
Scattering
(DIS2003)
St.Petersburg
29 April - 4 May 2003**



Welcome to St.Petersburg !