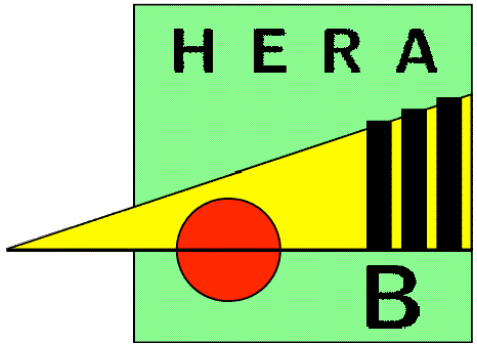
Physics from HERA-B



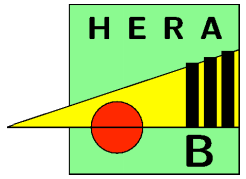
PRC open session

Oct 30th 2003

- List of analysis topics
- Discussion of selected topics

J. Spengler, MPI Heidelberg

Data Sample



Data taking: 30. Oct 2002 - 3. Mar 2003

- $150 \cdot 10^6$ dilepton triggered events with ~300,000 J/ψ

  achieved J/ψ rates: 1200 - 1400 / hour

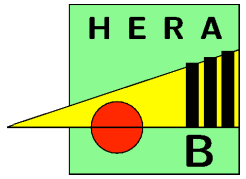
  in 2000: 30 - 40 / hour

- $210 \cdot 10^6$ minimum bias events

  achieved logging rates: 1000 Hz (1.7 TB/d)

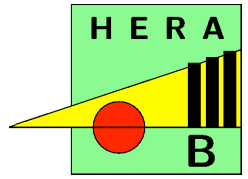
- $90 \cdot 10^6$ hard photon + Glueball trigger

Minimum Bias Topics

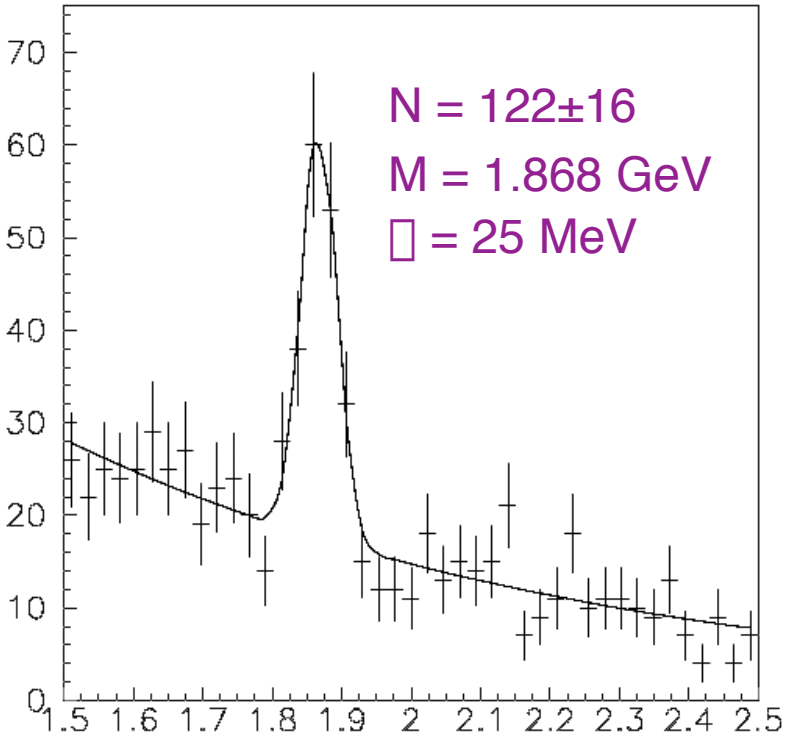


- Production of ρ^0 and K^{*0} mesons, A-dependence
- V^0 differential and total cross sections
- Λ^0 polarization
- Hyperon production ($\Xi^{\pm}$, $\Sigma^0(1530)$, $\Omega^{\pm}$)
- Search for Pentaquarks in pK^0_s and $\Xi^-\pi^-$
- Bose-Einstein correlations
- D^+ / D^0 production ratio; D^+, D^0, D^{*+} and J/ψ cross sections

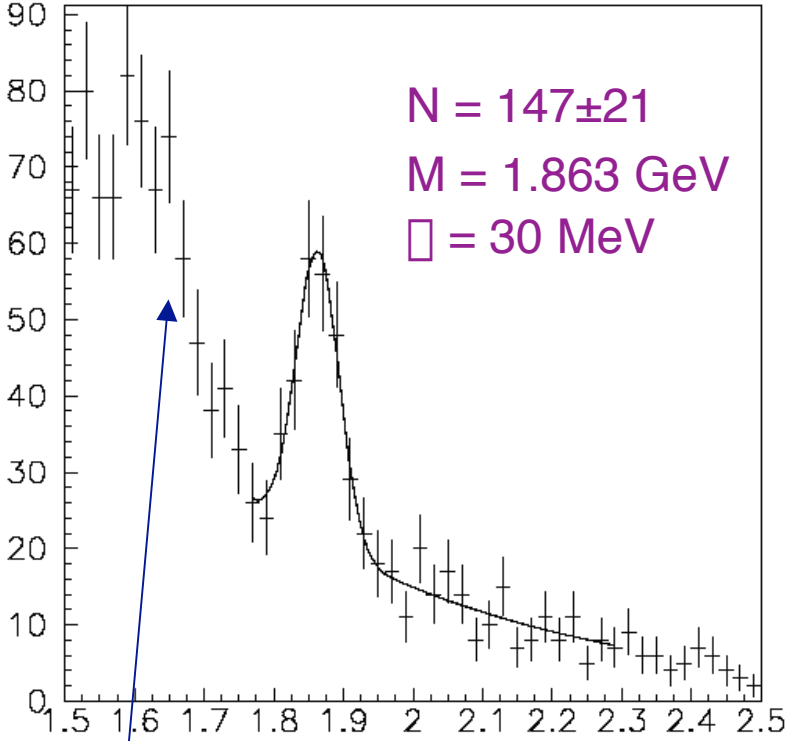
D^+ / D^0 Production Ratio



$D^+ \to K^- \pi^+ \pi^+$ + c.c.

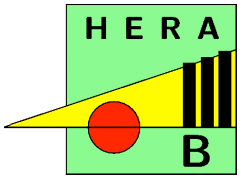


$D^0 \to K^- \pi^+$ + c.c.

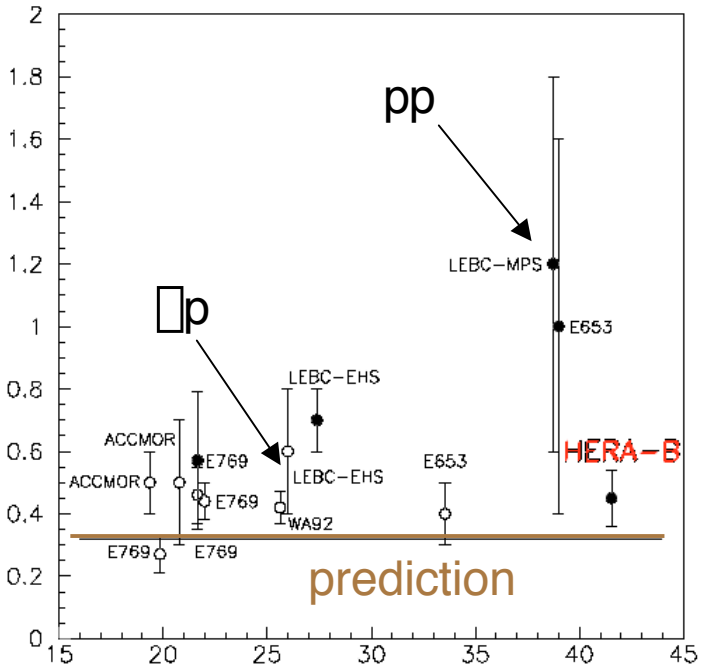


BG from charm decays

D^+ / D^0 Production Ratio

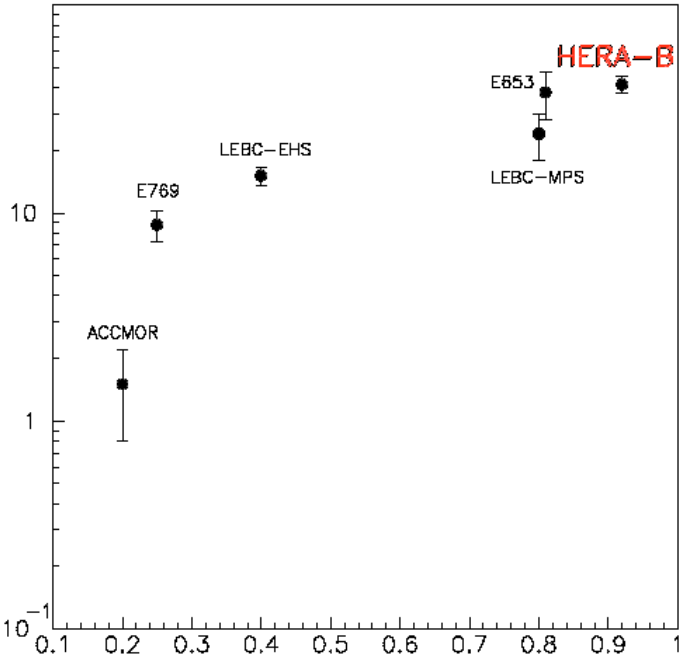


$\sigma(D^+) / \sigma(D^0)$



√s (GeV)

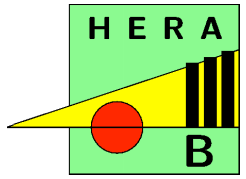
$\sigma_{D\bar{D}}$ (μb)



E_{beam} (TeV)

Preliminary: Absolute value might change; just look at error bar

Di-Lepton Trigger Topics



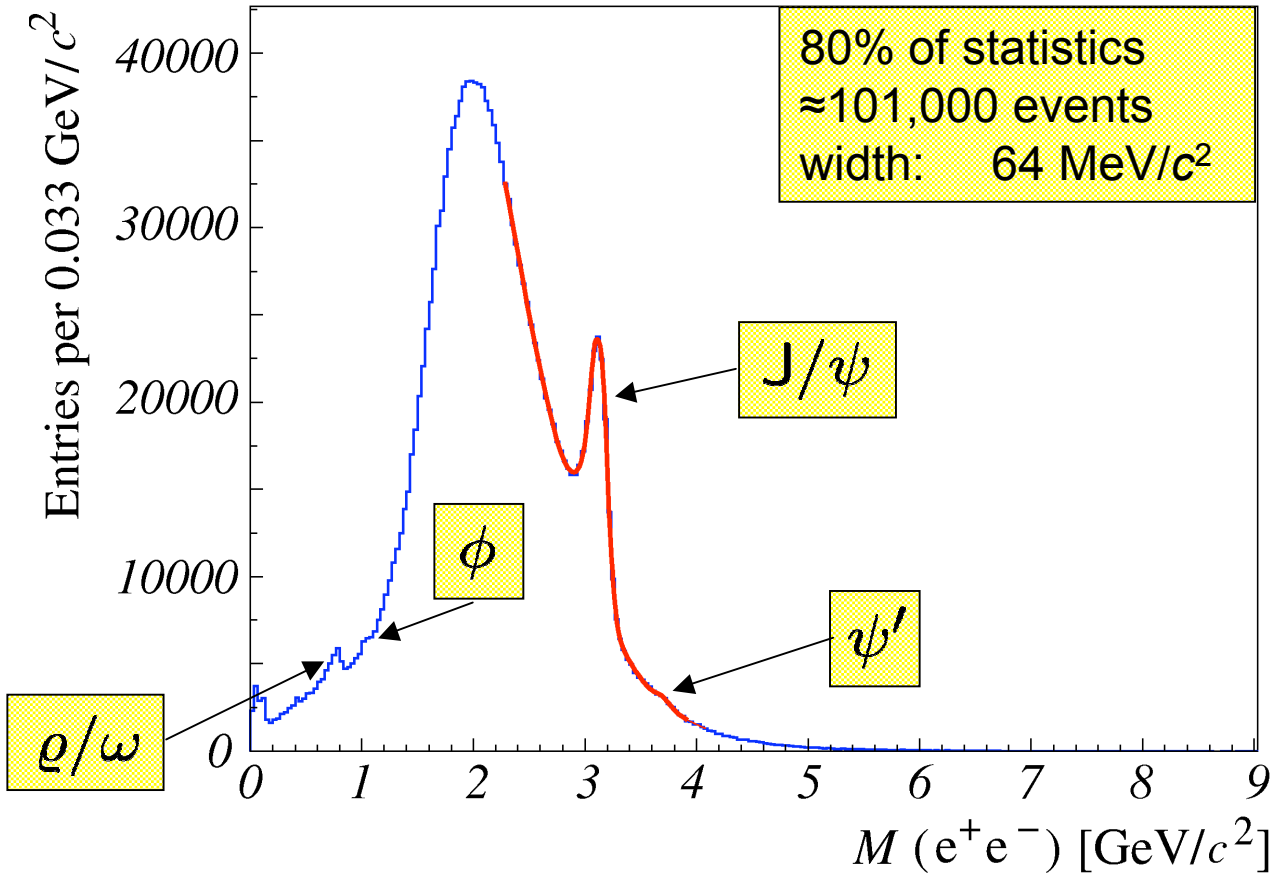
- Production ratio of J/ and (2S)
- J/ differential distributions {x_F (-0.3, 0.1); p_t (0, 5) GeV/c; polarization}
- Diffractive charmonium production

Previous PRC:

- A-dependence of charmonium production
- $_c$ production, A-dependence
- $b\bar{b}$ production cross section

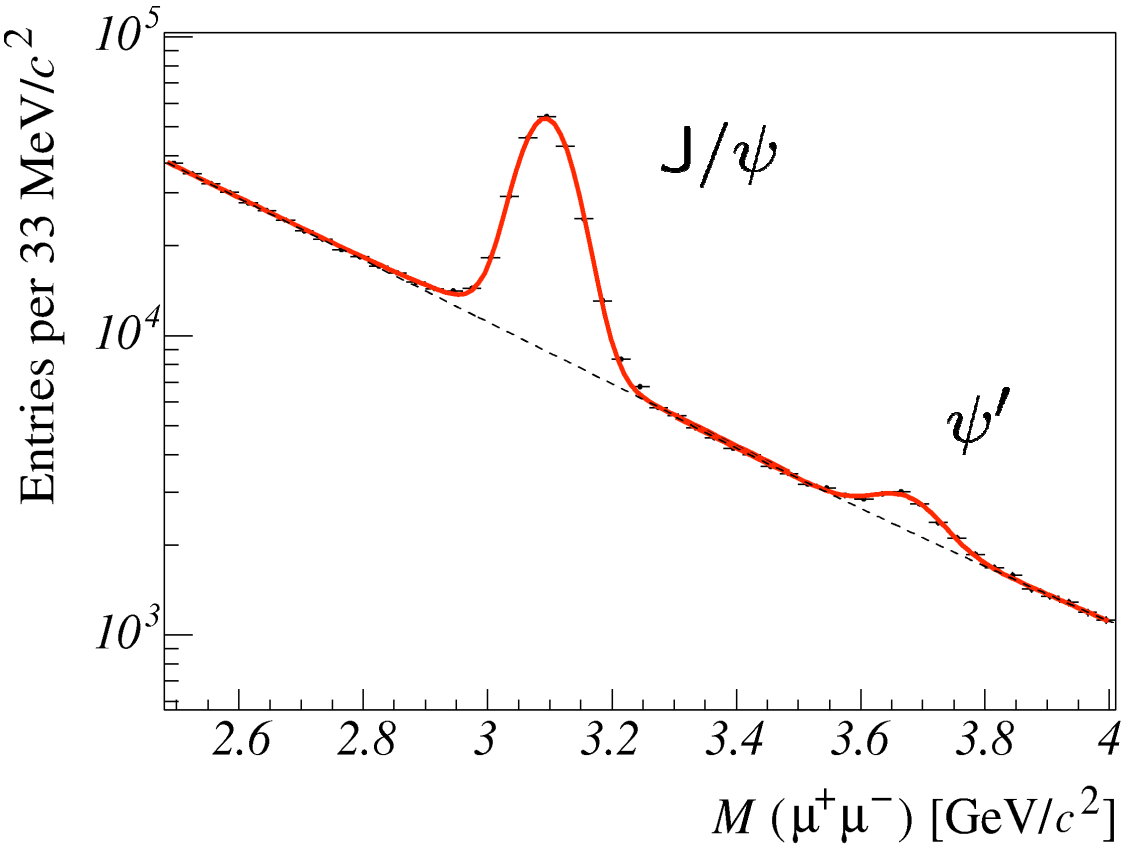
- production cross section
- Upper limit on Br(D^0 $^+$ $^-$)

J/□ Production; $e^+ e^-$



Dilepton mass accessible from 0 - 11 GeV/c²

Ratio R = □(2S) / J/□



	R (Carbon)
□⁺□⁻	0.016±0.002
e^+e^-	0.019±0.003

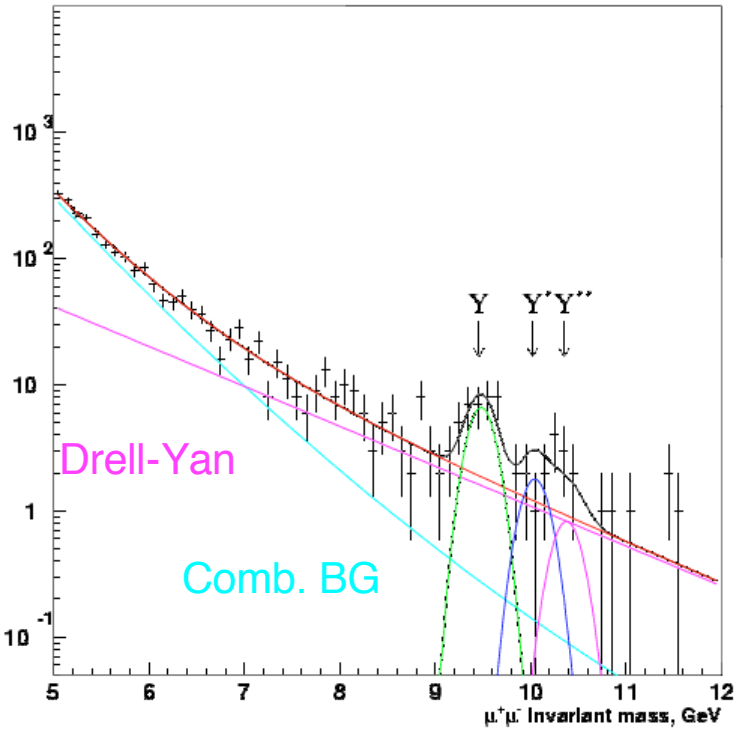
R value preliminary;

stat. errors only

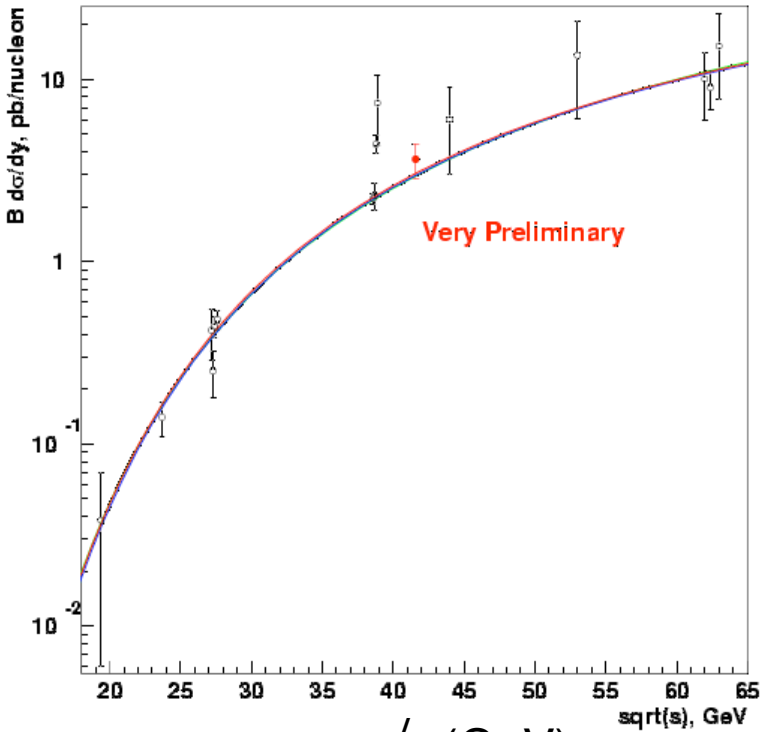
no acceptance correction yet.

Exp.	Target and Beam	R
E705	p-Li at 300 GeV	0.0188±0.0026
E789	p-Au at 800 GeV	0.0161±0.0010
E771	p-Si at 800 GeV	0.0186±0.0020

□ Cross Section



M(□⁺□⁻) (GeV/c²)



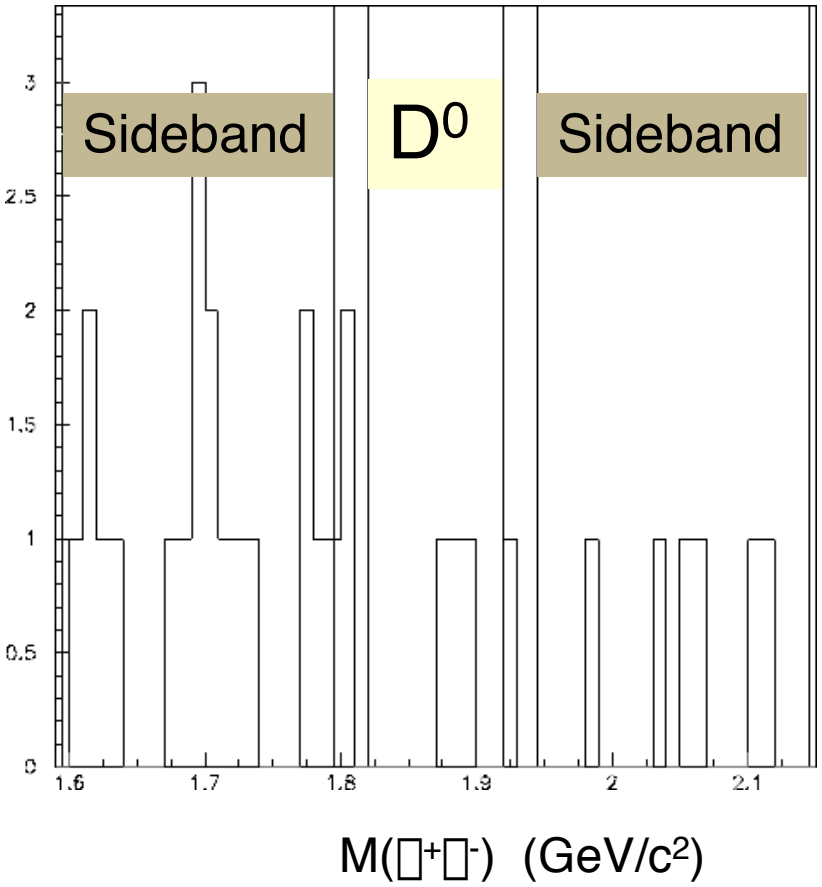
√s (GeV)

	Events	□ width (data)	□ width (MC)
□⁺□⁻	33±8	139±30	146
e⁺e⁻	35±11	160±58	200

Preliminary:

Br• d□/dy $|_{y=0}$ = 3.6±0.8 pb/nucleon

FCNC Decay $D^0 \to \mu^+\mu^-$



Find 3 events in D^0 region

Preliminary result at 90% CL (Systematic studies ongoing):

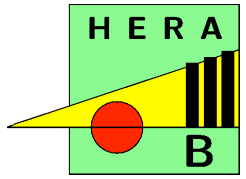
$Br(D^0 \to \mu^+\mu^-) < 2.2 \cdot 10^{-6}$

PDG: $4.1 \cdot 10^{-6}$

CDF: $2.5 \cdot 10^{-6}$ (hep-ex/0308059)

MSSM predicts $3.5 \cdot 10^{-6}$ (PRD 66, 014009 (2002)

Summary



- Analysis of 2002/03 data in progress
- Final reprocessing of data started
- First preliminary results available
- Several abstracts submitted to Quark Matter 01/2004