

Relativistic Nuclear Collision Meeting

alias

• Rhein-Neckar-Main-Workshop •

(Darmstadt - Heidelberg - Frankfurt)

(Mailer: RNM-workshop@gsi.de)

● **7th RNM-Meeting:**

Thursday, 17 July 1997, 14:30 sharp, GSI-Hörsaal, GSI-Darmstadt

J/PSI, OPEN CHARM and DRELL YAN production

Agenda:

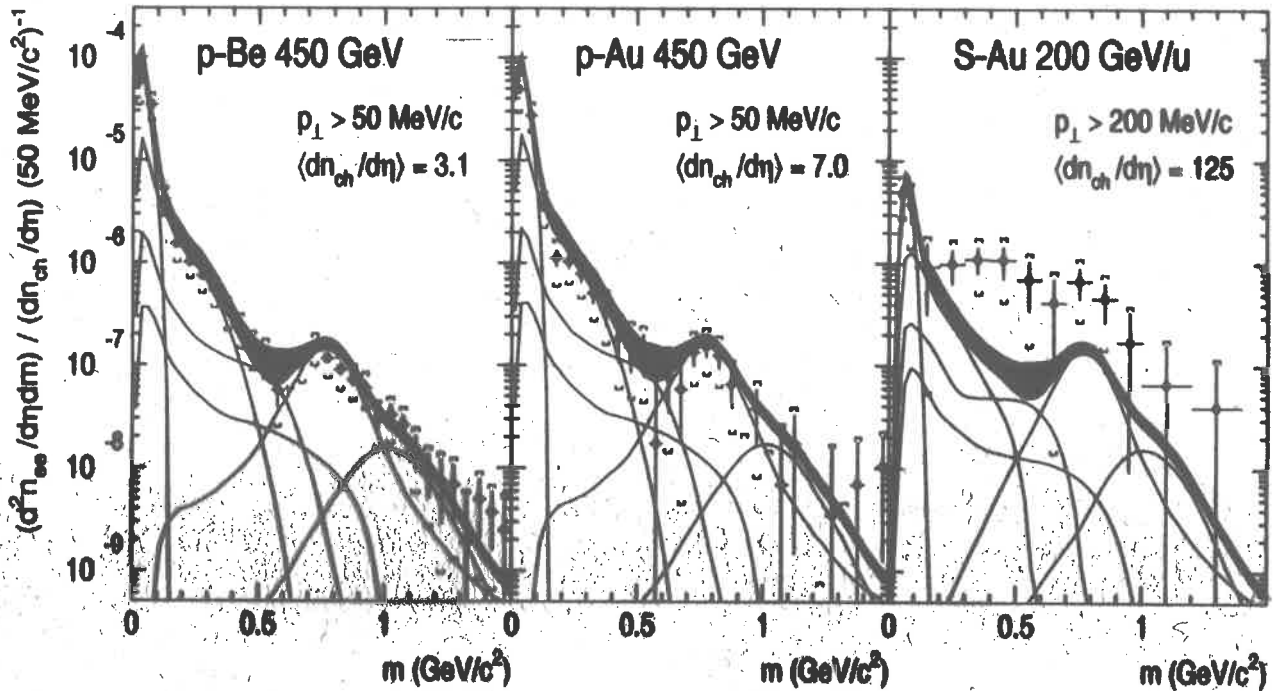
1. Boris Kopeliovich
Light-cone dynamics of Drell-Yan pair and charmonium production in medium
2. Christian Speies
Drell-Yan and charm production in heavy ion collisions
3. Elena Bratkovskaya
Production of c and anti-c pairs in nuclear collisions at SPS energies
4. Dariusz Miskowiec
Open charm contribution to the dilepton spectra produced in nuclear collisions at SPS energies

- organized by Prof. Horst Stöcker (Univ. Frankfurt),
email: stoecker@th.physik.uni-frankfurt.de

Please contact J.Knoll@gsi.de, if you want to be added to the e-mail distribution list.

- List of old RNM-Meetings.
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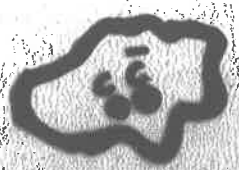
CERES dilepton excess



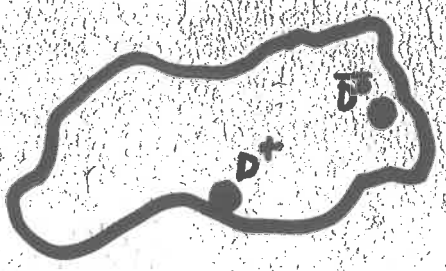
POSSIBLE EXPLANATIONS

- ρ -SHIFT
- ρ -BROADENING
- DIRECT PRODUCTION
- DCC
- OPEN CHARM DECAY

HOW IT HAPPENS:



10^{-1} IN CENTRAL Pb+Pb @ 160 GeV
 10^{-4} IN MIN. BIAS p+p

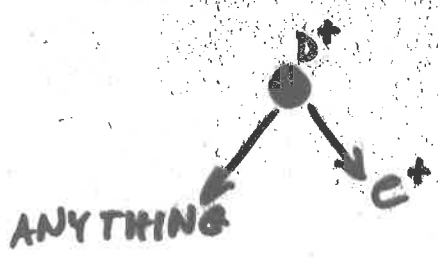


D^+	$c\bar{d}$
D^0	$c\bar{u}$
D_s^+	$c\bar{s}$
Λ_c^+	udc

$CT \sim 0.2 \text{ nm}$



7%



17%

CAN OPEN CHARM DECAY ACCOUNT FOR CERES EXCESS ?

P. BRAUN-MUNZINGER

D. MISKOWIEC

A. DREES

C. LOURENÇO

1. INTRODUCTION

2. TUNING PYTHIA TO PP \rightarrow DD̄ DATA

3. UPSCALING TO AA \rightarrow DD̄

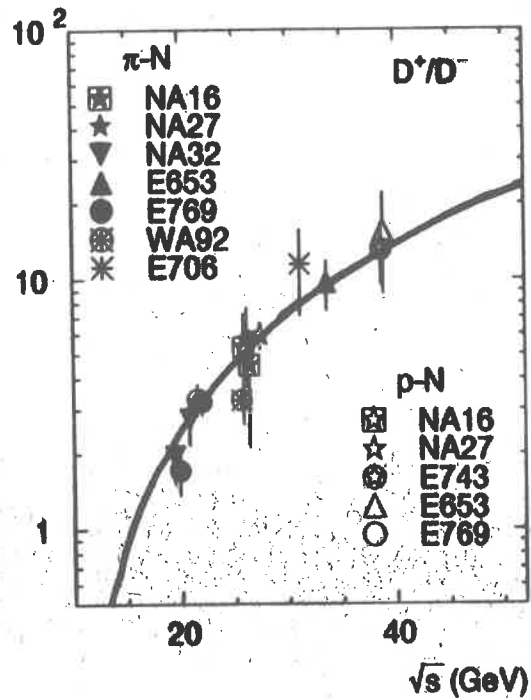
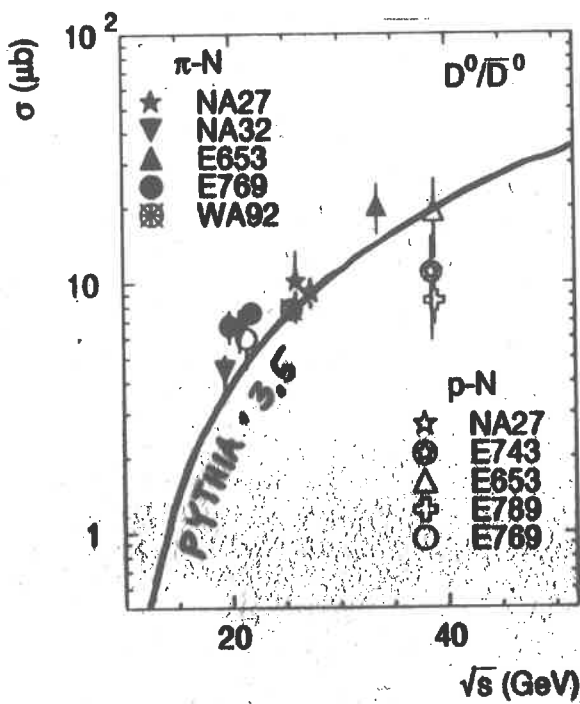
4. LET D'S DECAY, CERES FILTER

5. RESULT: YES OR NO ?

D production with proton and pion beams

DATA: COMPILATION BY C. LOURENÇO

PYTHIA 5.710 JETSET 7.405



AGREEMENT:

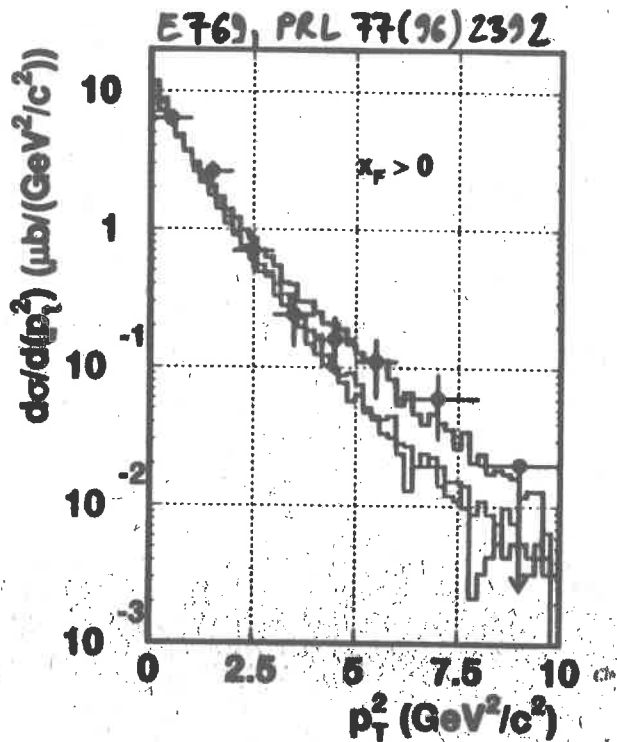
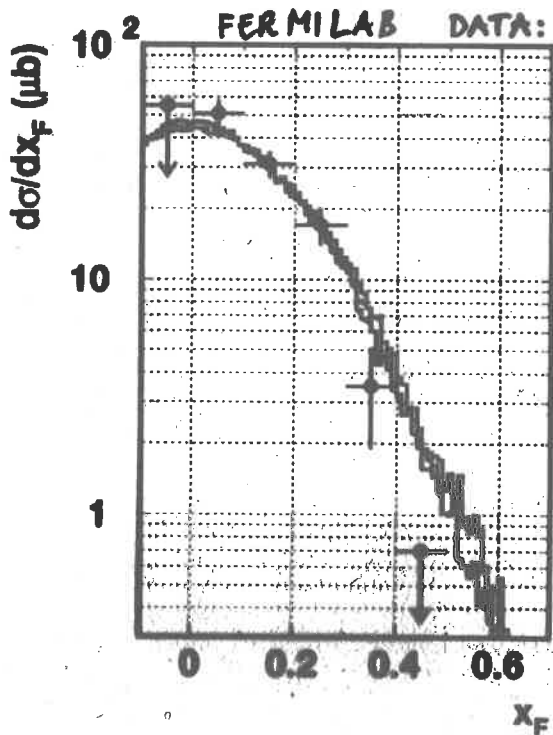
D-YIELD, $K=5.0$

\sqrt{s} DEPENDENCE

DISAGREEMENT:

D^+/\bar{D}^- RATIO

D production in p-p at 250 GeV

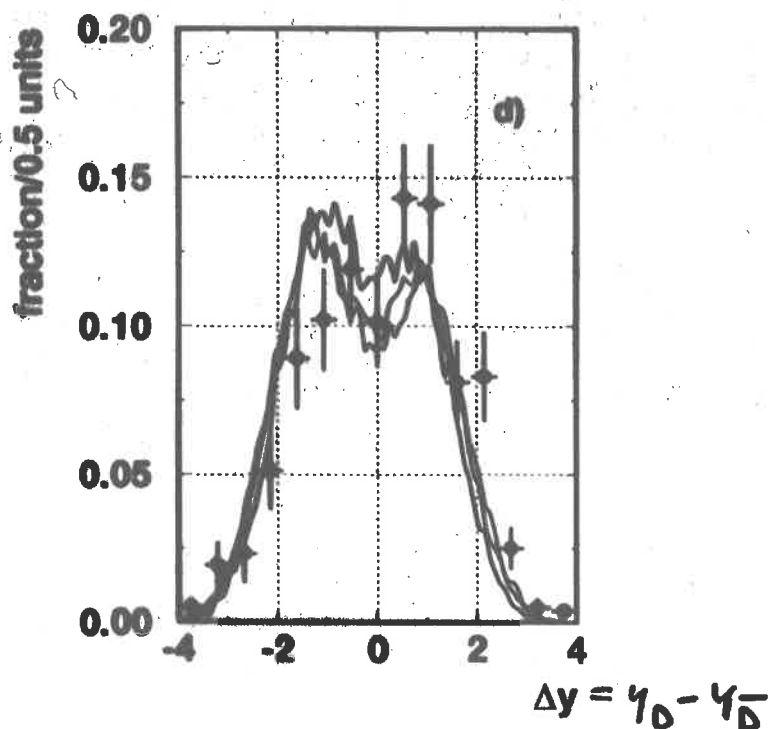
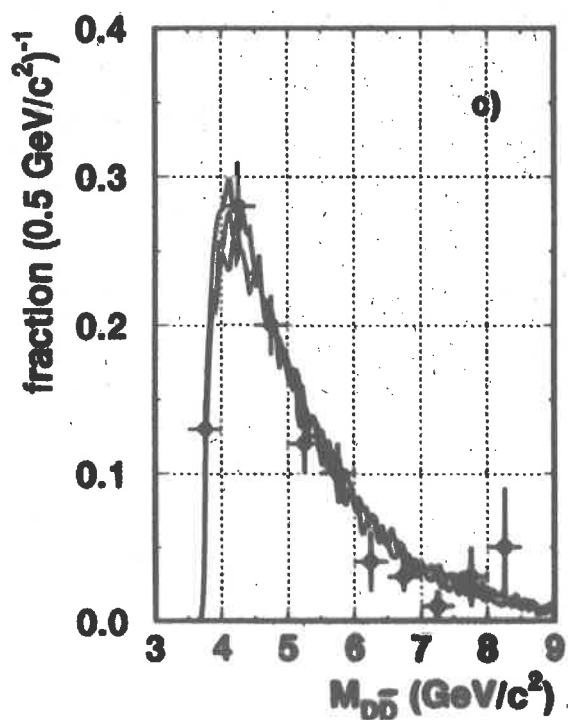
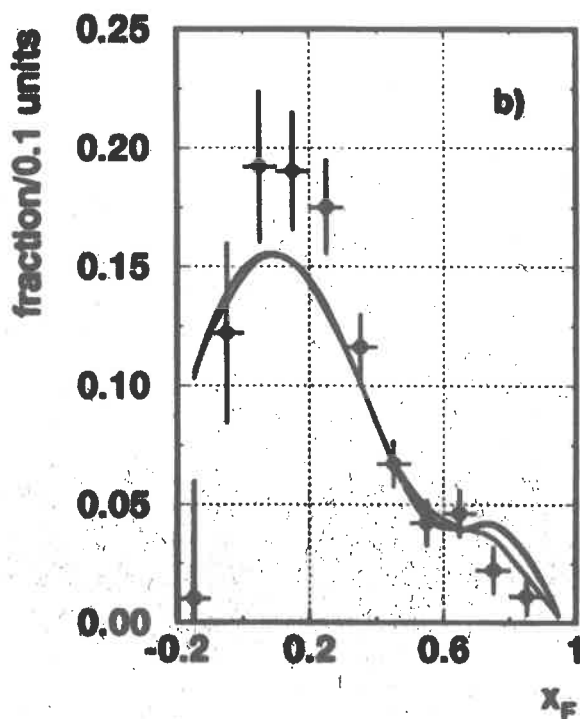
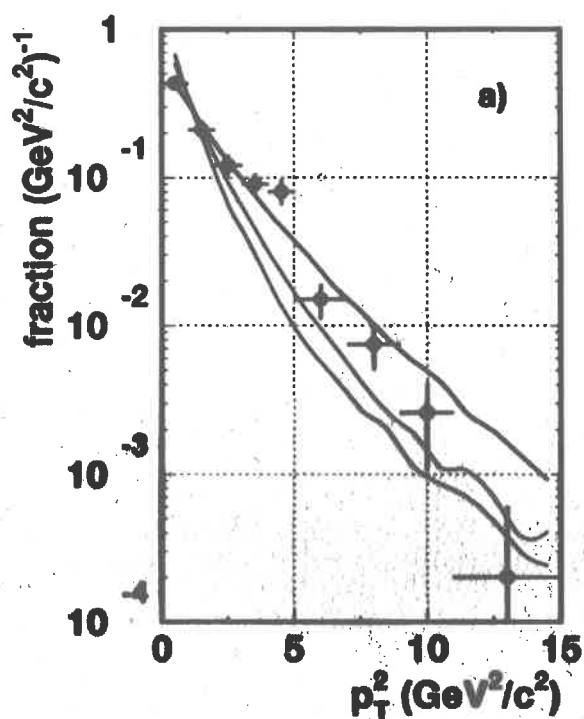


- _____ $\langle k_T^2 \rangle = 2 \text{ GeV}^2/c^2$
- _____ $\langle k_T^2 \rangle = 1 \text{ GeV}^2/c^2$
- _____ $\langle k_T^2 \rangle = 0.64 \text{ GeV}^2/c^2$

$\langle k_T^2 \rangle^{1/2}$ - WIDTH OF PRIMORDIAL k_{\perp} DISTRIB.
INSIDE HADRON, DEFAULT $\langle k_T^2 \rangle = 0.2$

D- \bar{D} pair production in π^- -Cu at 360 GeV

WA92 DATA, CERN-PPE/96-180.

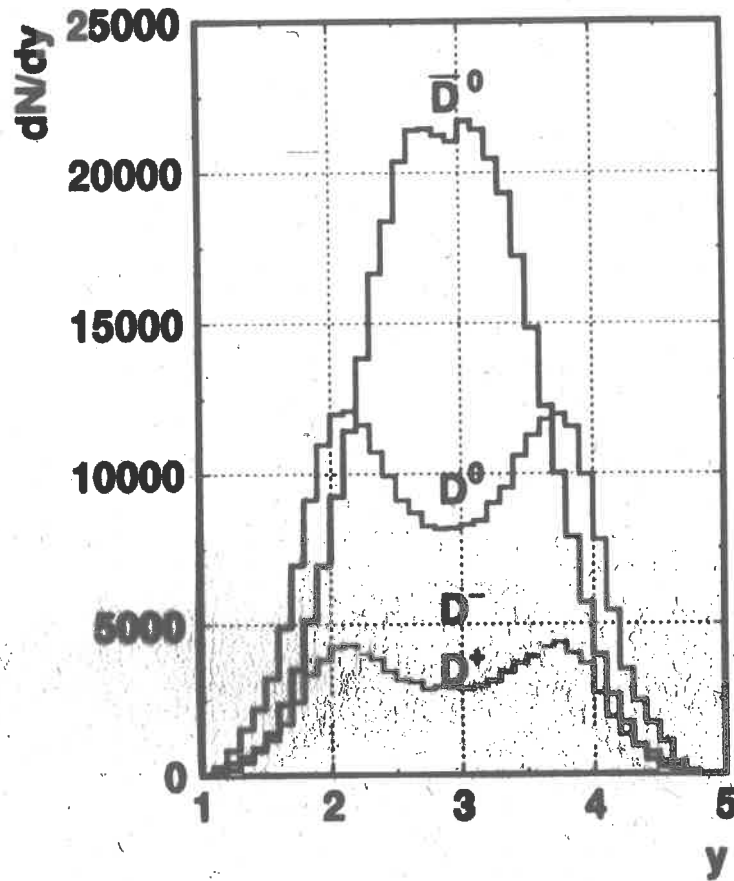


NON-TRIVIAL RAPIDITY DISTR.

1. y_D AND $y_{\bar{D}}$ CORRELATED

2. $\left(\frac{dN}{dy}\right)_D$ HAS FUNNY SHAPE

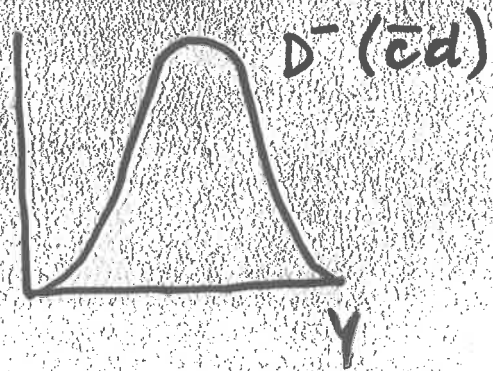
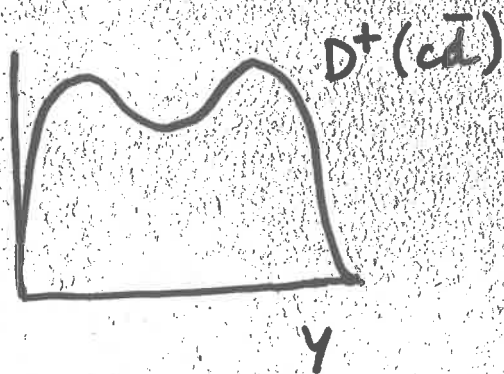
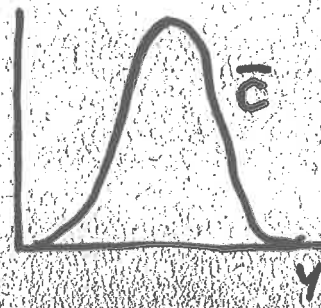
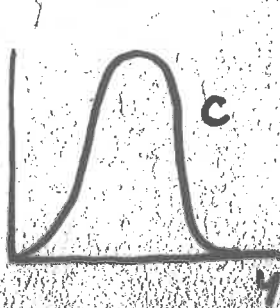
Rapidity distribution of D-mesons



PYTHIA, $pp \rightarrow D\bar{D}$, 160 GeV

ORIGIN OF THE RAPIDITY GAP FOR D^+ AND D^0

(ACCORDING TO PYTHIA)



BEAM (OR TARGET) PROTON DRAGS THE
C-QUARK BY FORMING A $C-UU$ OR
 $C-Ud$ STRING.

PYTHIA PARAMETERS

PYTHIA 5.710

JETSET 7.405

STRUCTURE FUNCTION MRS G

$$M_c = 1.35 \text{ GeV}/c^2$$

$$K = 5.0$$

$$\langle k_T^2 \rangle = 1 \text{ GeV}^2/c^2$$

PP TO pA SCALING

$$\sigma \sim A^\alpha, \quad \alpha = 1.02 \pm 0.05 \quad (\text{E789})$$
$$\alpha = 1.00 \pm 0.07 \quad (\text{E769})$$

PP TO AB SCALING

(ESCOLA, NUCL. PHYS. B323(89)37)

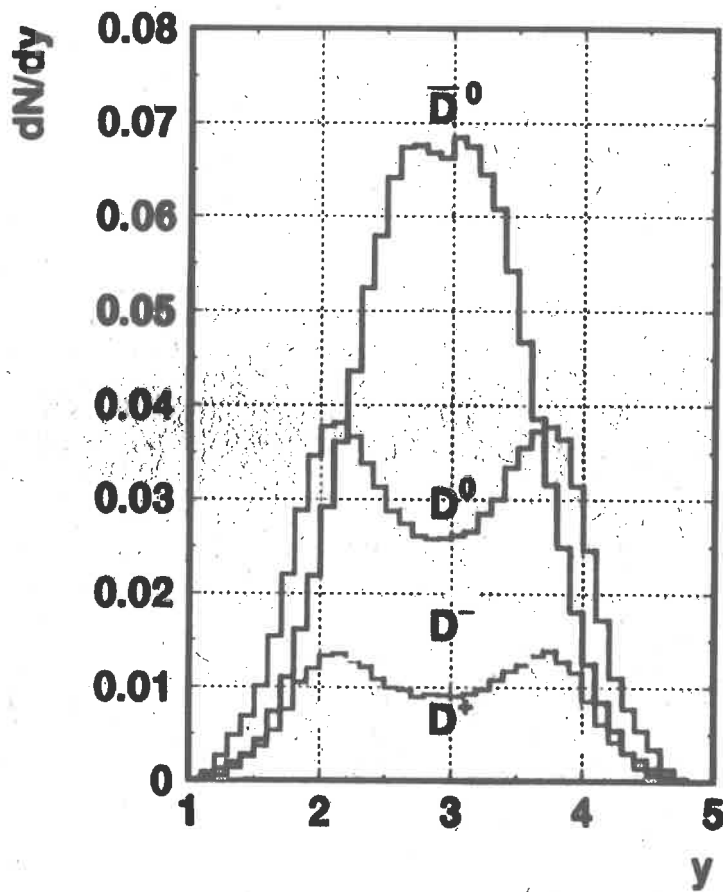
$$T_{AB}(\vec{b}) := \int d^2r_T \int dz_A S_A(\vec{r}_T + \vec{b}, z_A) \int dz_B S_B(\vec{r}_T, z_B)$$

$$\sigma_{AB} = \underbrace{\int_0^{b_{\max}} 2\pi b db \cdot T_{AB}(b)}_{A \cdot B} \cdot \sigma_{PP}$$

$$N_{AB} = \frac{\int_0^{b_{\text{cut}}} 2\pi b db \cdot T_{AB}(b)}{\underbrace{\pi b_{\text{cut}}^2}} \cdot \sigma_{PP}$$

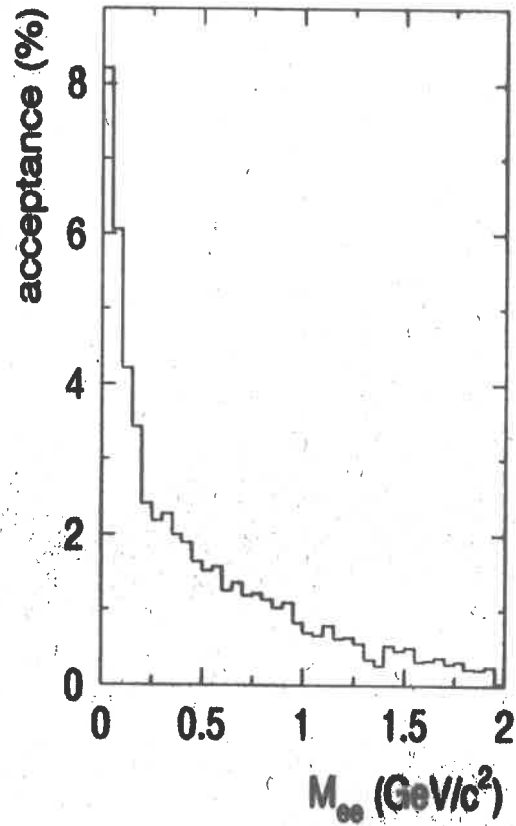
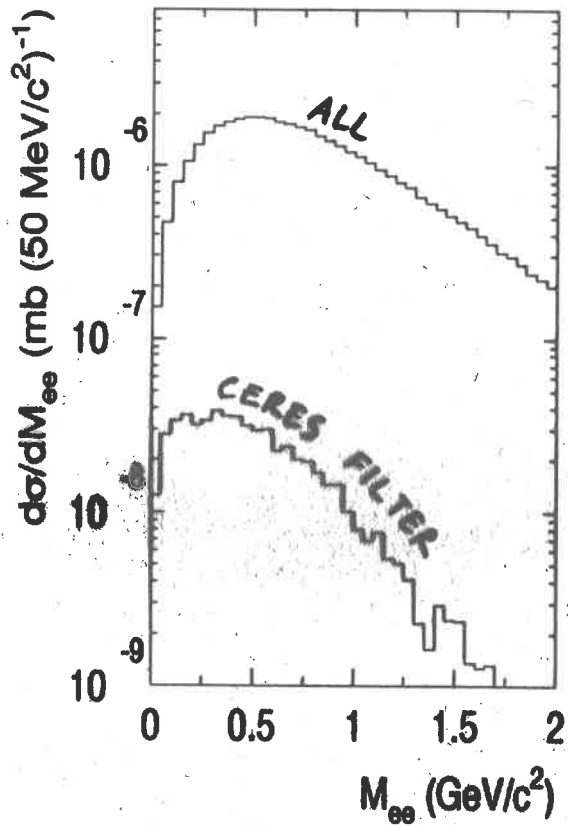
28 mb⁻¹ FOR Pb+Pb 5% CENTRAL

D production in Pb+Pb at the SPS

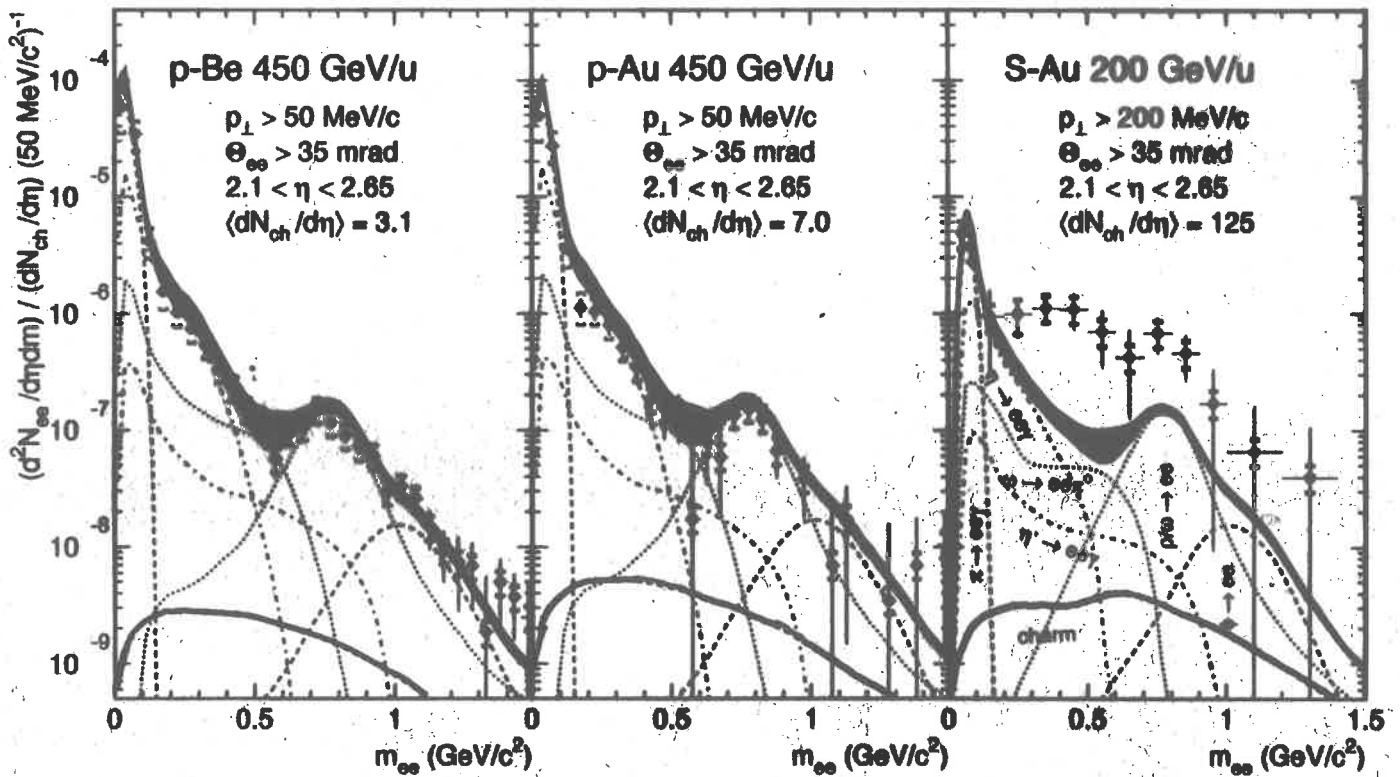


Dileptons from D-decay

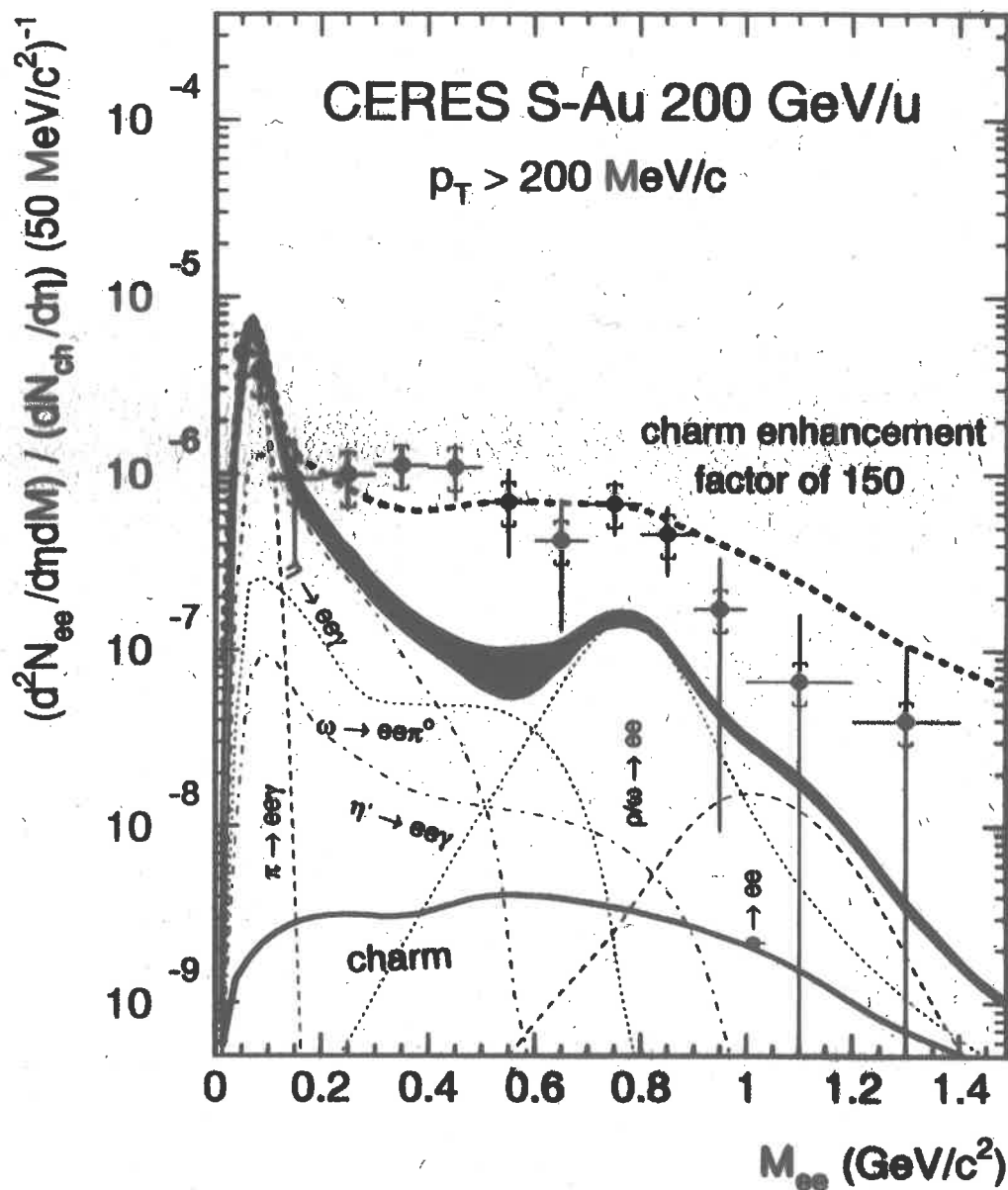
PP 450 GeV



Charm contribution to CERES dileptons



CERES dilepton excess - not from charm



Charm contribution to NA38/NA50 dimuons

