

# INCLUDING D, B IN THE SIMULATION

MOTIVATION

$B \rightarrow \tau/\mu$

$D, B \rightarrow e^+, e^-$

## 1. EXPECTED D, B SPECTRA

- TUNE PYTHIA TO CDF DATA  $\rightarrow K$
- RUN PYTHIA FOR 5.5 TeV PP
- UPSCALE FROM PP TO Pb Pb CENTRAL
- EXTRACT  $\frac{dN}{dy}$  AND PARAMETRIZE  $P_T$  DISTR.

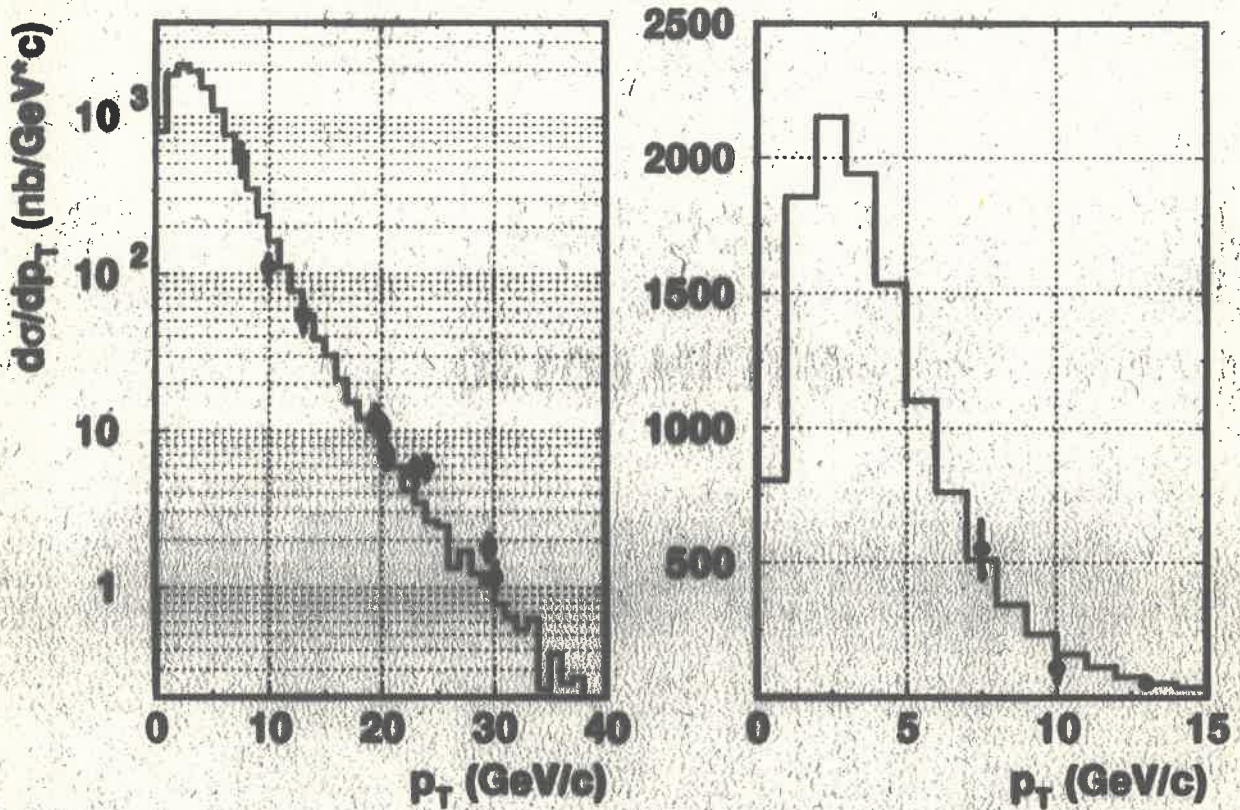
## 2. PUT THEM INTO SHAKER

- CORRECT THE  $P_T$  GENERATION BUG
- UPDATE GETSET PART OF SHAKER
- IMPLEMENT MULTIPLICITIES  $< 1$
- GIVE B, D ID NUMBERS
- ADD THEM!
- TEST (COMPARE TO PYTHIA)

## 3. RERUN THE ENTIRE SIMULATION, OR

## 3'. DO ESTIMATIONS AT THE LEVEL OF SHAKER OUTPUT

# B<sup>+</sup> production in p-pbar at 1.8+1.8 TeV, 1y.l.t.1



◊ - CDF PRELIMINARY DATA (FROM WEB)

— - PYTHIA, 1 MEAN PYTHIA = 3.0



**K=3**

# D, B YIELDS IN CENTRAL 5%

Pb + Pb AT  $\sqrt{s} = 5.5$  TeV

FROM  
PYTHIA

K FACTOR

UPSCALE FROM pp to PbPb

$$\frac{dN}{dy} \cdot 6 \cdot 3 \cdot 28 \text{ mb}^{-1}$$

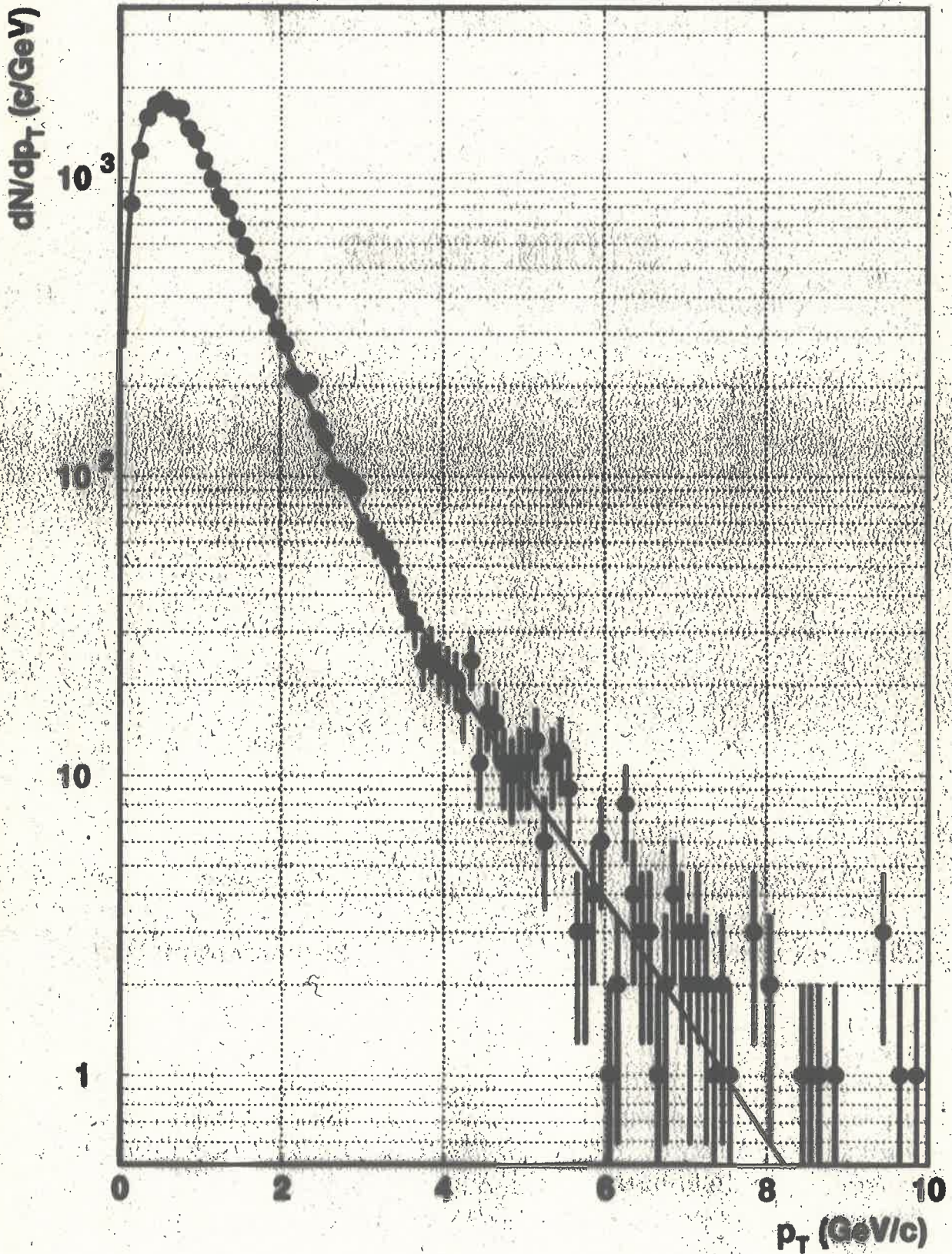
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|         |            |      |
|---------|------------|------|
| $D^+$   | $c\bar{d}$ | 19   |
| $D^0$   | $c\bar{u}$ | 54   |
| $D_s^+$ | $c\bar{s}$ | 10   |
| $B^+$   | $u\bar{b}$ | 0.55 |
| $B^0$   | $d\bar{b}$ | 0.55 |
| $B_s^0$ | $s\bar{b}$ | 0.16 |

# $D^+, D^0, D_s^+$ $p_T$ DISTRIBUTION

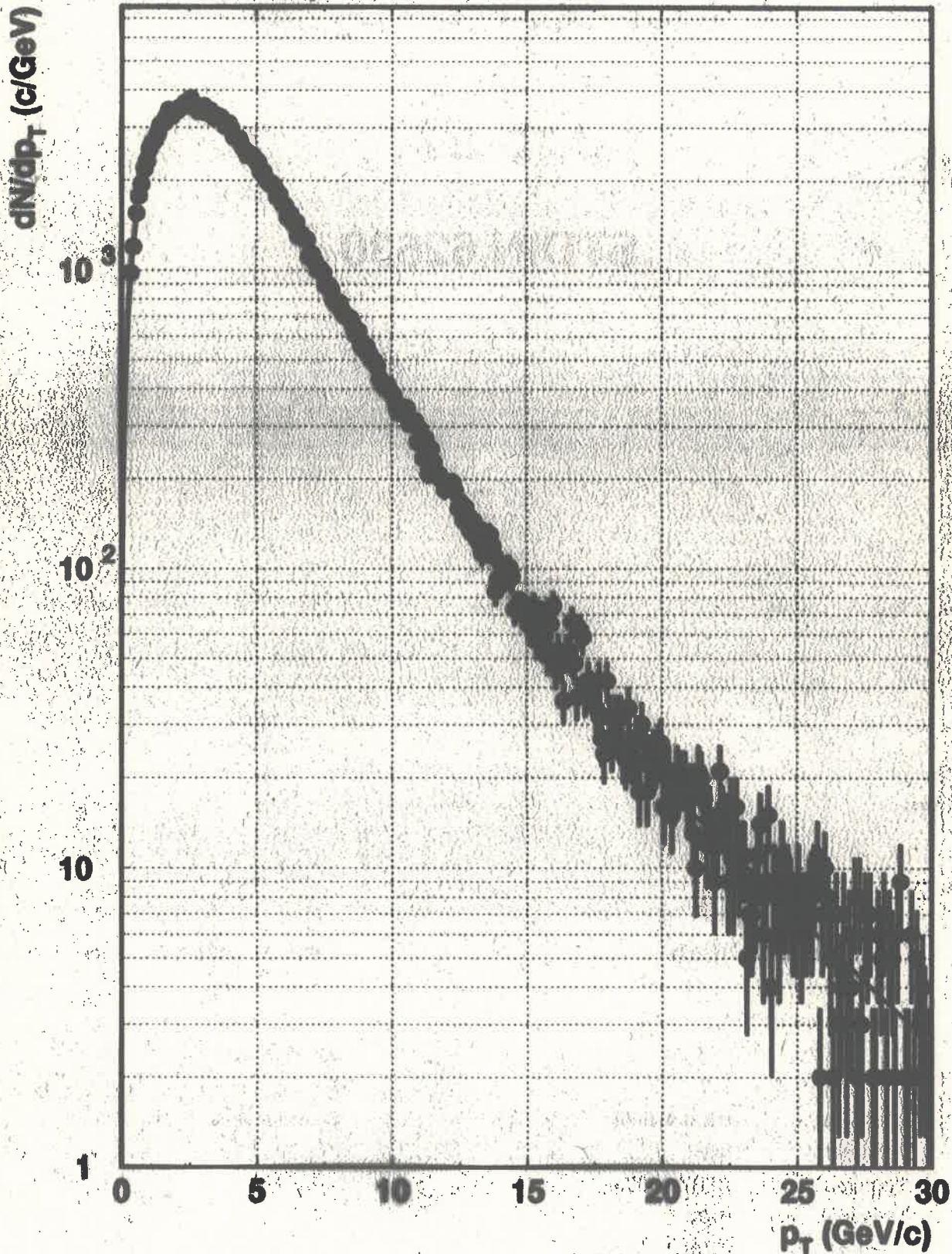
FROM PYTHIA

$$dN/dp_T \approx x^{1.3} (e^{-x/0.39} + 0.018 e^{-x/0.91})$$



# $B^+, B^0, B_s$ $p_T$ DISTRIBUTIONS FROM PYTHIA

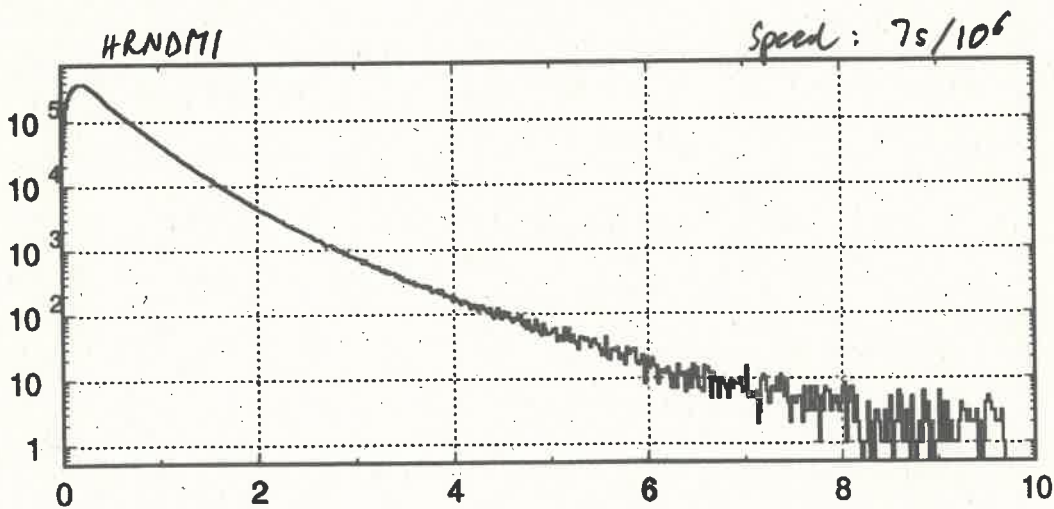
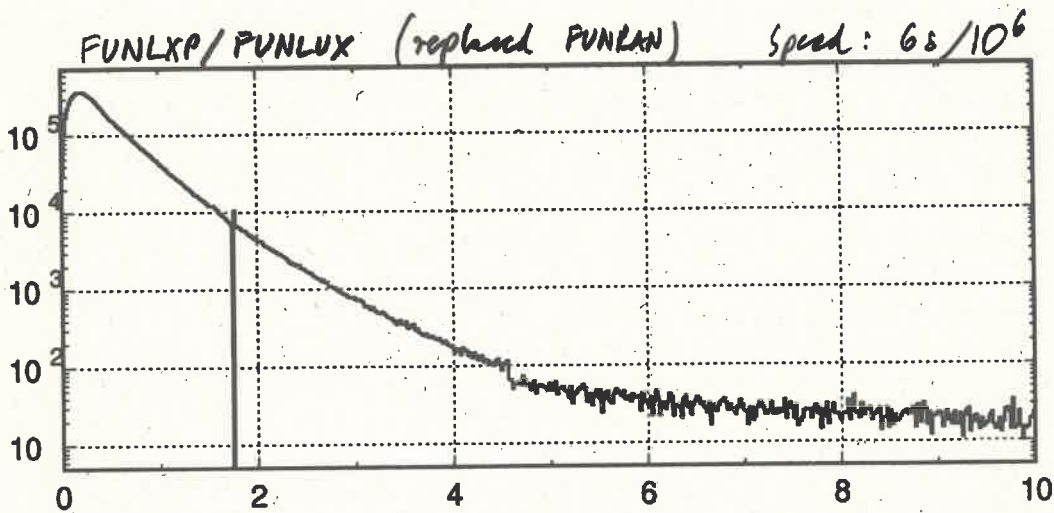
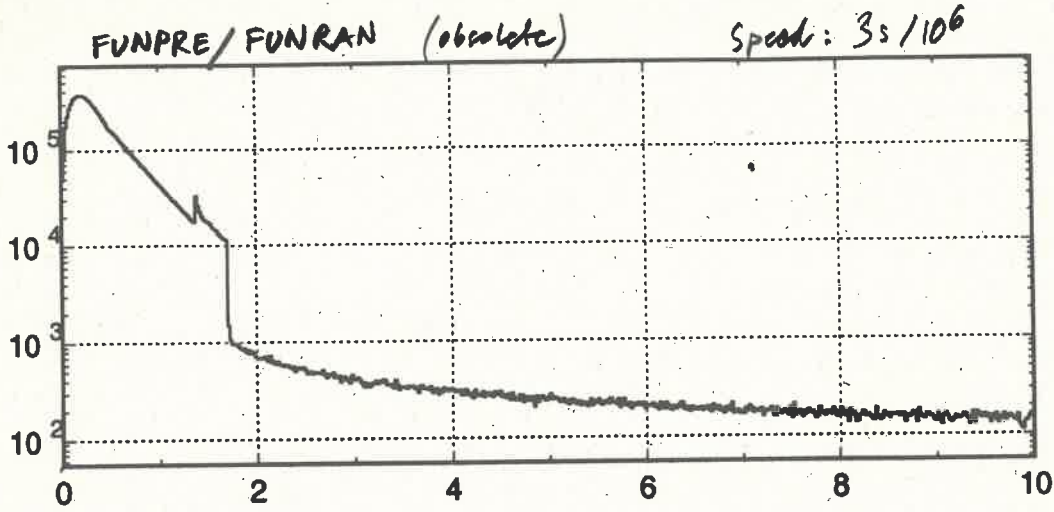
$$dN/dp_T \approx x^{1.3} (e^{-x/1.78} + 0.96e^{-2} e^{-x/4.16})$$



Comparison of different routines for random number generation. Tested on AIX, dr16g.

# P1 PROBLEM IN SHAKER

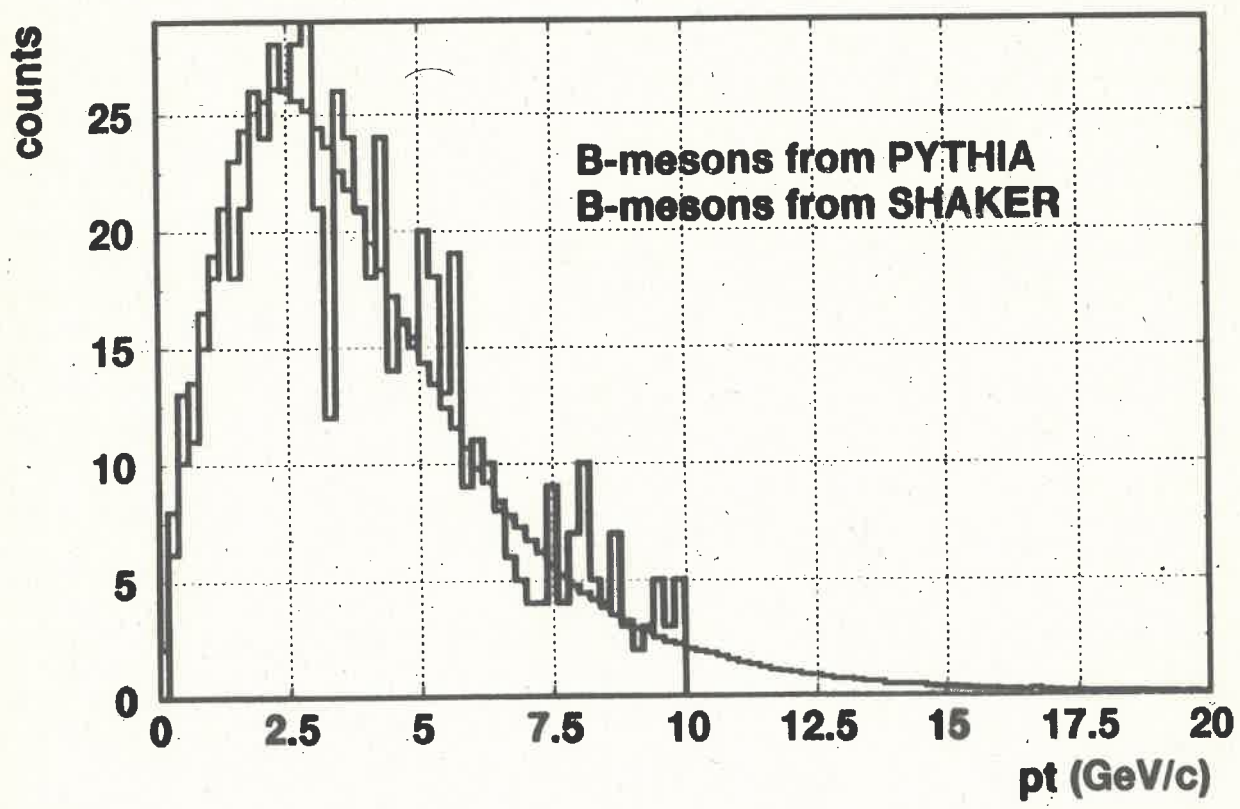
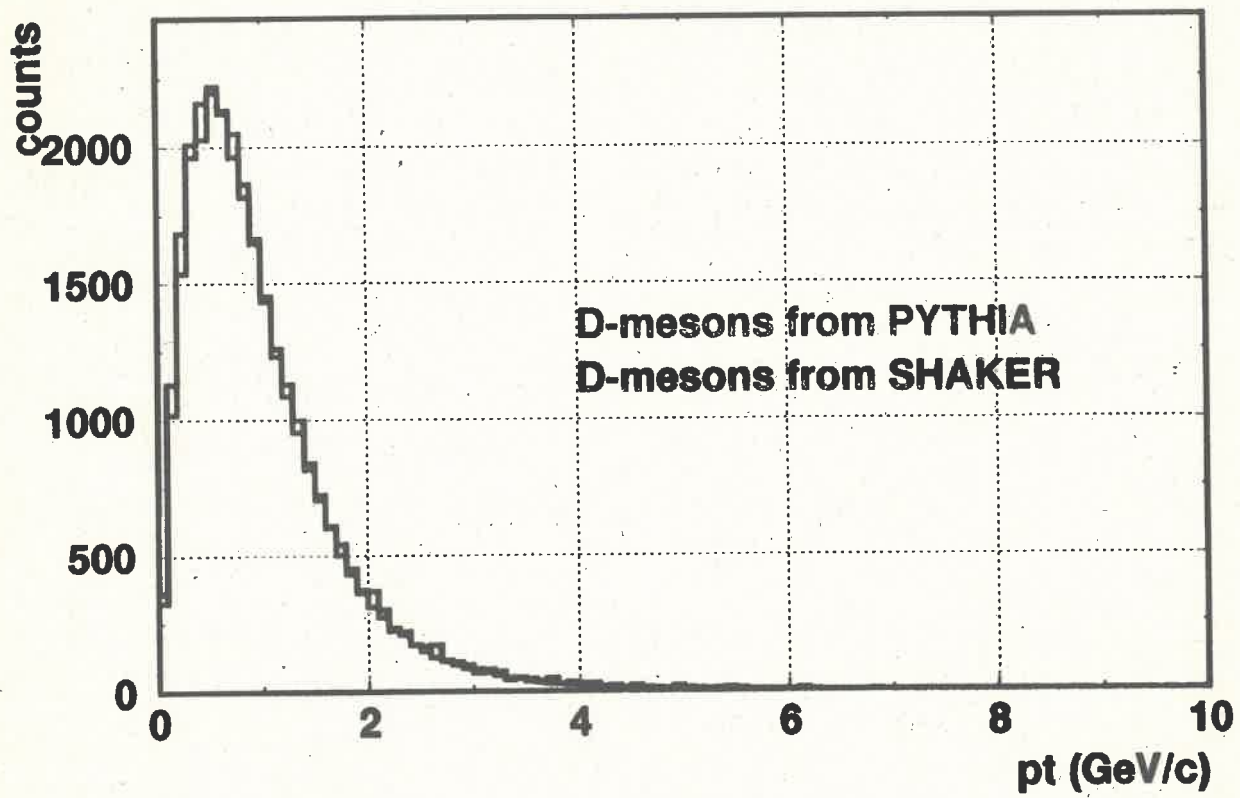
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# B, D ID NUMBERS

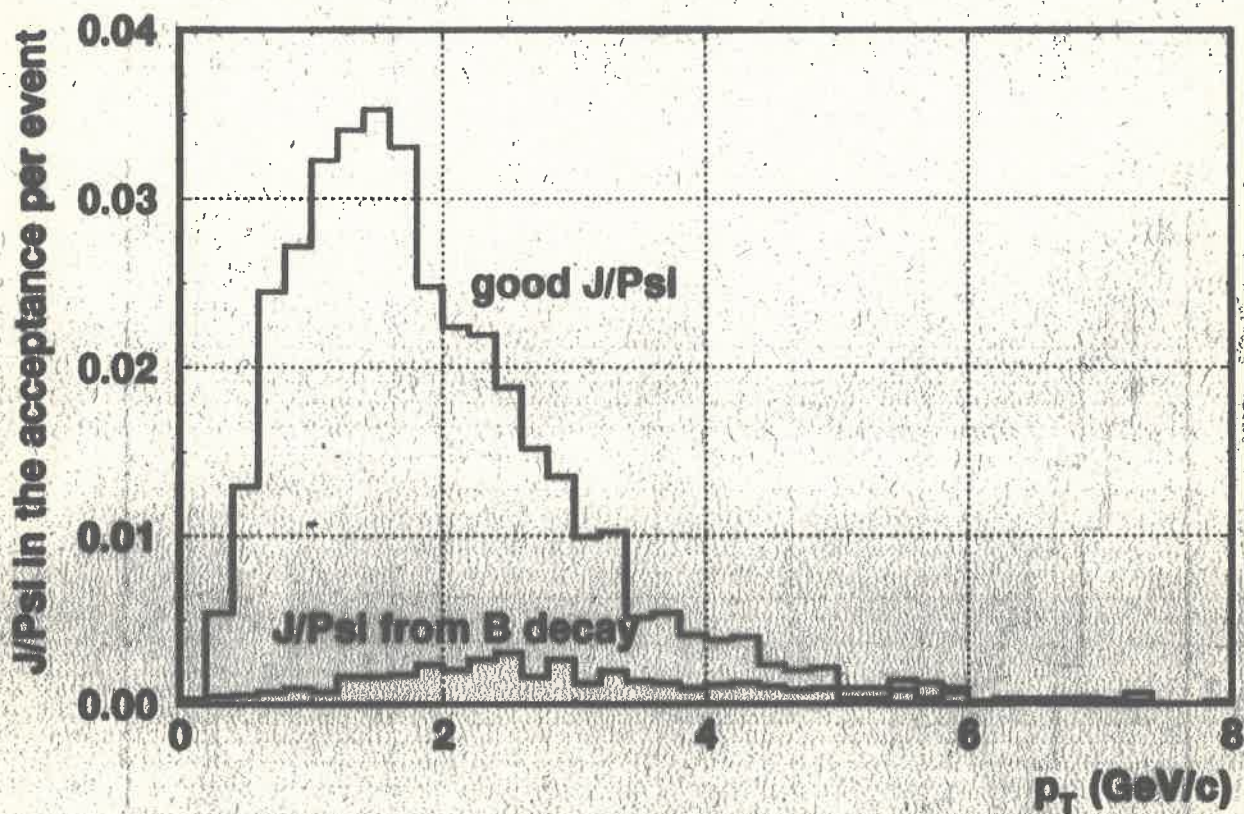
|                    | <u>KF</u> | <u>SHAKER</u> |
|--------------------|-----------|---------------|
| $D^+$              | 411       | 35            |
| $D^-$              | -411      | 36            |
| $D^0$              | 421       | 37            |
| $\overline{D^0}$   | -421      | 38            |
| $D_3^+$            | 431       | 57            |
| $D_3^-$            | -431      | 58            |
| $B^+$              | 521       | 53            |
| $B^-$              | -521      | 54            |
| $B^0$              | 511       | 51            |
| $\overline{B^0}$   | -511      | 52            |
| $B_3^0$            | 531       | 55            |
| $\overline{B_3^0}$ | -531      | 56            |

# TEST OF $P_{\perp}$ PARAMETRIZATION IN SHAKER

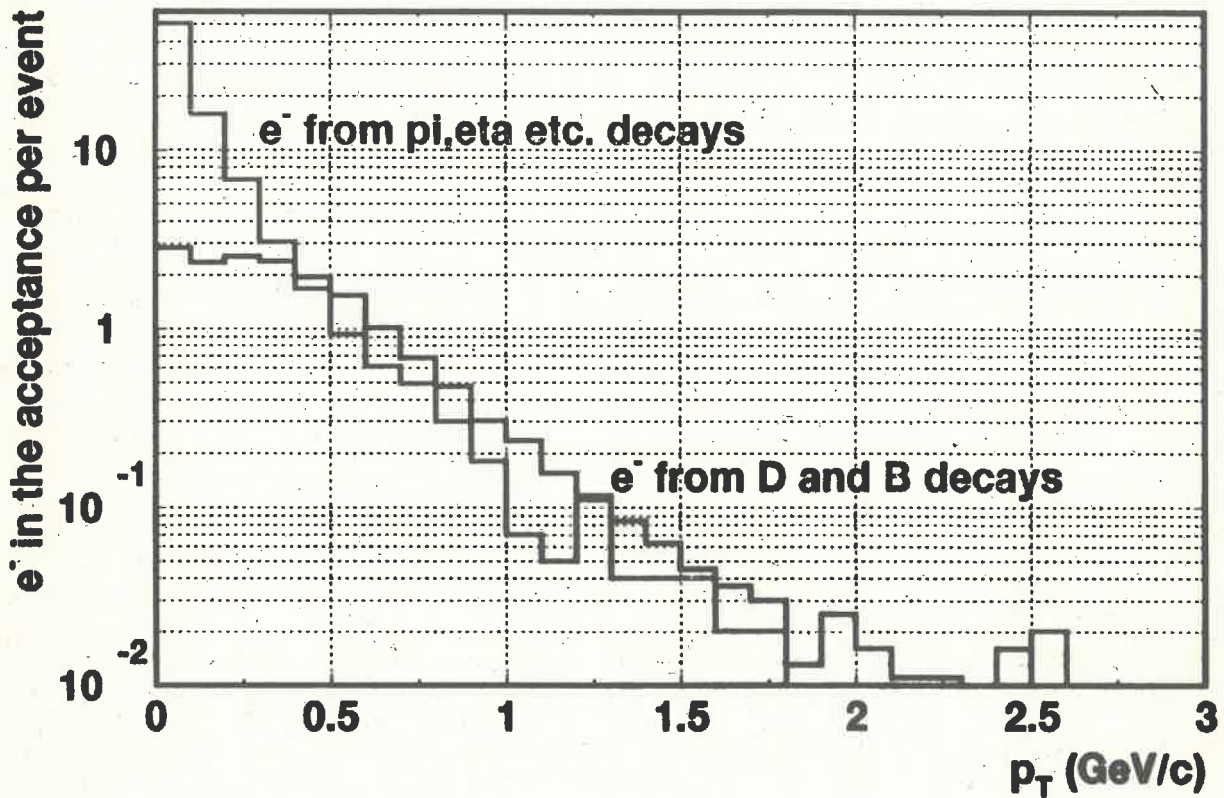




# B-decay contribution to J/Psi p<sub>T</sub> spectrum



## D,B decay contribution to $e^-$ spectrum

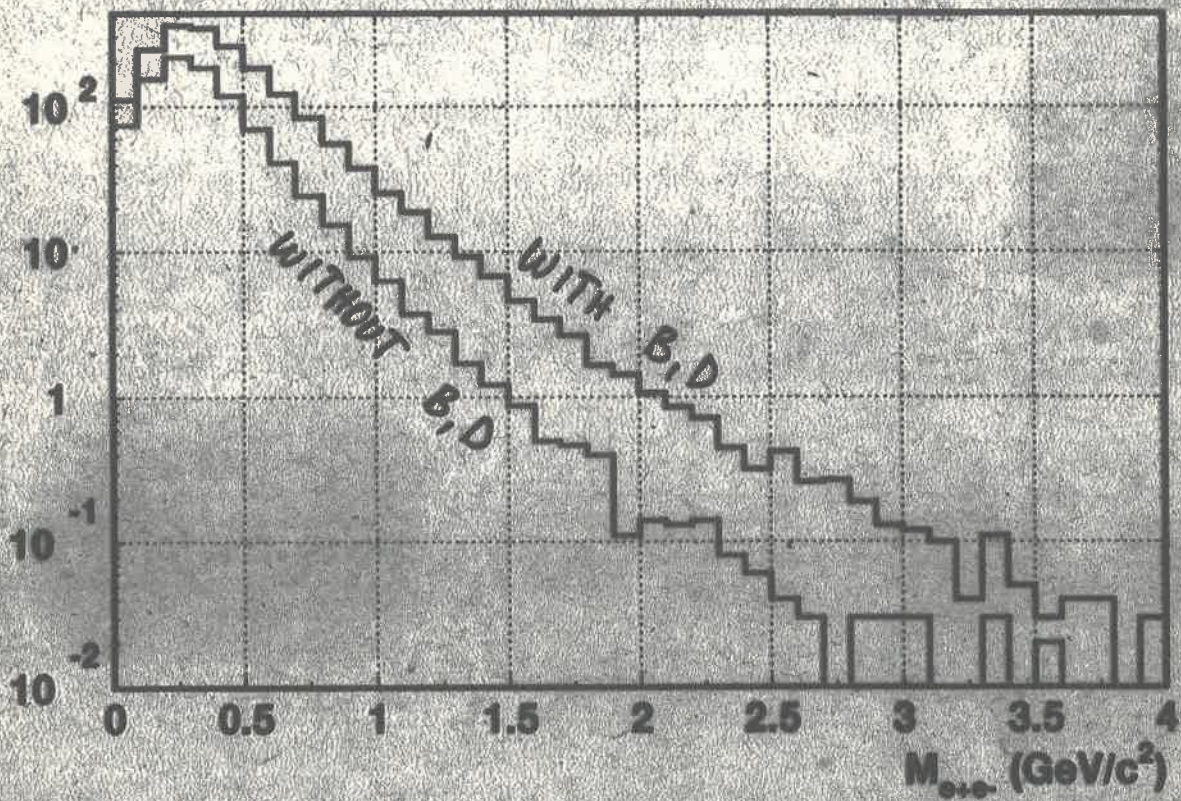


THIS SIMULATION: 55 e<sup>-</sup> PER EVENT

FULL SIMULATION (GALICE) : 100 e<sup>-</sup> PER EVENT

} p<sub>T</sub> > 50 MeV/c

# Contribution of leptons from D, B decays



$P_{\perp} > 100 \text{ MeV}/c$