

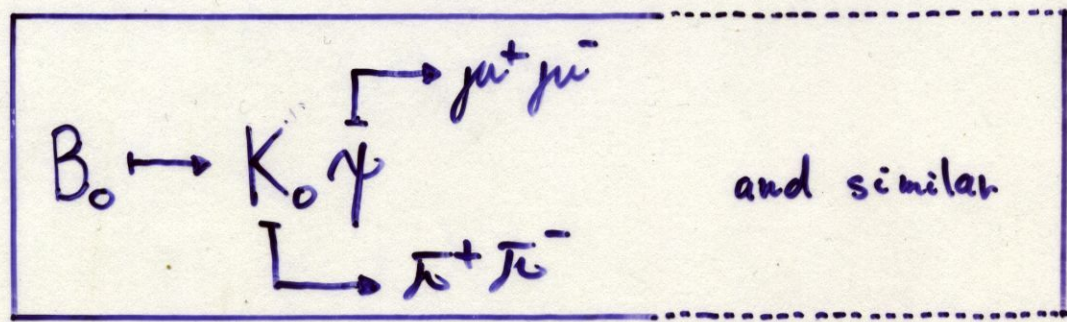
Is it possible to measure

**CP-violation**

by the **Ascot-Eagle** detector

on the **LHC**

via:



?

**Yes!**

(At least it seems to us after the very first look into the problem.)

# How many events can we get

$$\sigma(pp \rightarrow b\bar{b} | p_{\perp}^b > 20 \text{ GeV}) = 1.1 \cdot 10^5 \text{ pb}$$

$$\int \mathcal{L} dt$$

$$= 10^4 \text{ pb}^{-1}$$

$$\left( \begin{array}{l} \mathcal{L} = 10^{33} \text{ cm}^{-2} \text{ s}^{-1} \\ \Delta t = \frac{1}{3} \text{ year} \end{array} \right)$$

$$\text{Br}(b \rightarrow \mu^+ \mu^- \pi^+ \pi^-) = 2 \cdot 10^{-5}$$

$$\epsilon(\mu\text{-tag}) = .95$$

$$\epsilon(\text{detector}) = .15$$

$$\left( \begin{array}{l} \epsilon(\mu^+ \mu^- \pi^+ \pi^- \text{ in detector}) \\ \epsilon(p_{\perp}^{k_s} > 1 \text{ GeV}) \\ \epsilon(p_{\perp}^{\pi} > 10 \text{ GeV}) \\ \epsilon(|\Delta \phi| \in \langle 1; 30 \rangle \text{ cm}) \\ \epsilon(\angle(k_s; \gamma) < 45^\circ) \end{array} \right)$$

$$\epsilon(\text{identification}) = .80 \cdot .95$$

$$N \doteq 3100$$

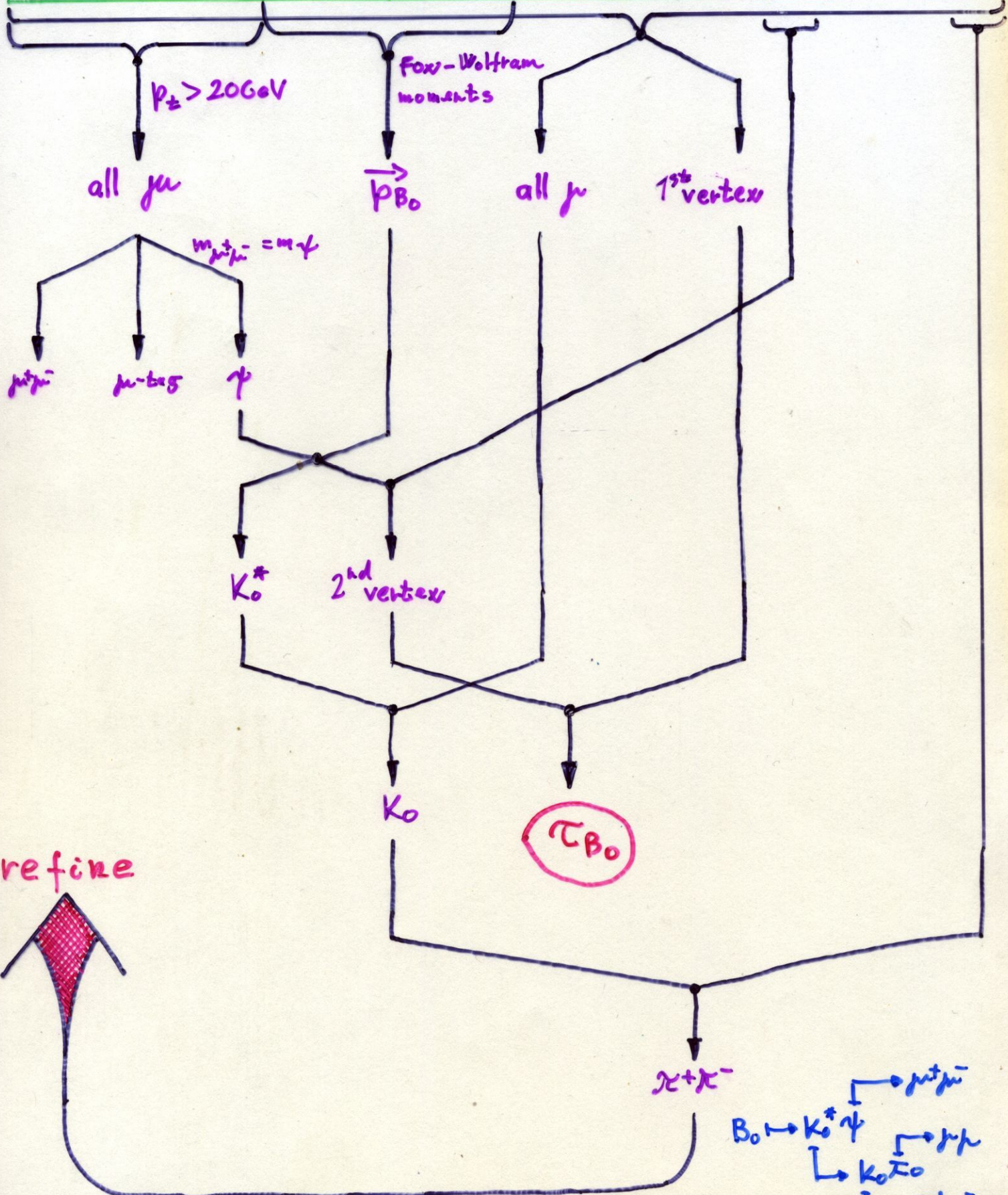
- $\epsilon$  are taken in a very pessimistic way
- $p_{\perp}^b > 15 \text{ GeV}$  may double  $\sigma$

(generated by Pythia & Geant/Slug/Dice)

Event-recognition

Ascot — Eagle

$\mu$ -det.	calor.		preshower	tracking		
$\mu$ -det.	H-cal.	E-cal.	preshower	SITV	MSGC	SLT · TRD



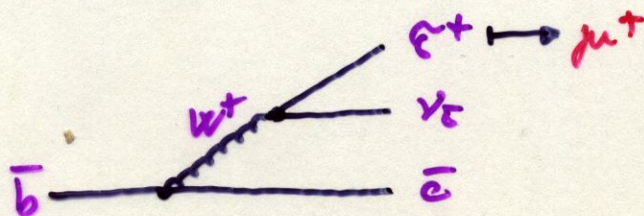
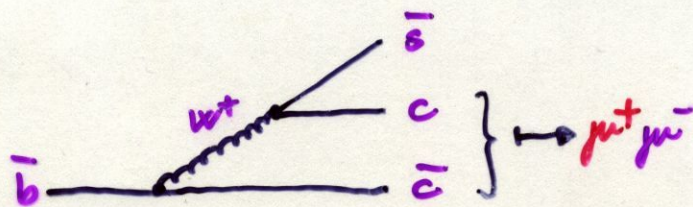
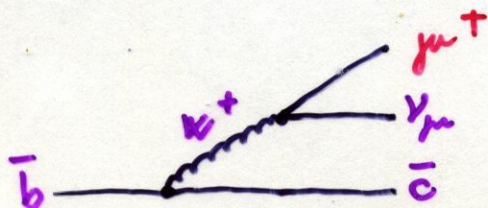
$B_0 \rightarrow K_0^* \psi$   
 $\quad \quad \quad \downarrow$   
 $\quad \quad \quad \mu^+\mu^-$   
 $\quad \quad \quad \downarrow$   
 $\quad \quad \quad \mu\mu$   
 $\quad \quad \quad \downarrow$   
 $\quad \quad \quad K_0 \pi_0$   
 $\quad \quad \quad \downarrow$   
 $\quad \quad \quad \pi^+\pi^-$

# Dilution

$$D = 1 - 2w = \frac{N(\text{good tags}) - N(\text{bad tags})}{N(\text{good tags}) + N(\text{bad tags})}$$

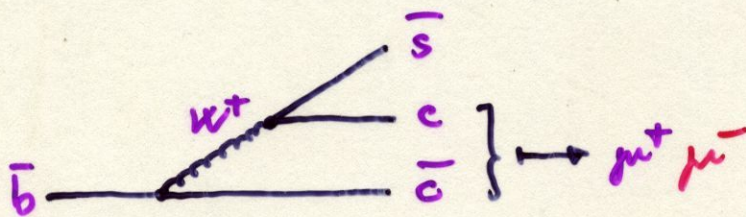
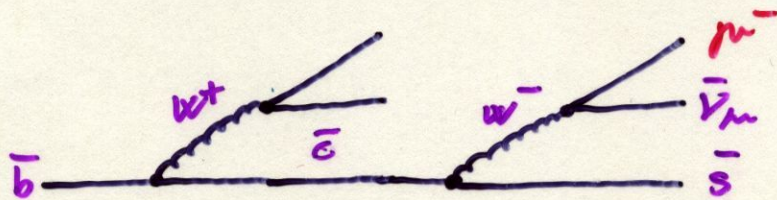
good tags:

89%



bad tags:

11%

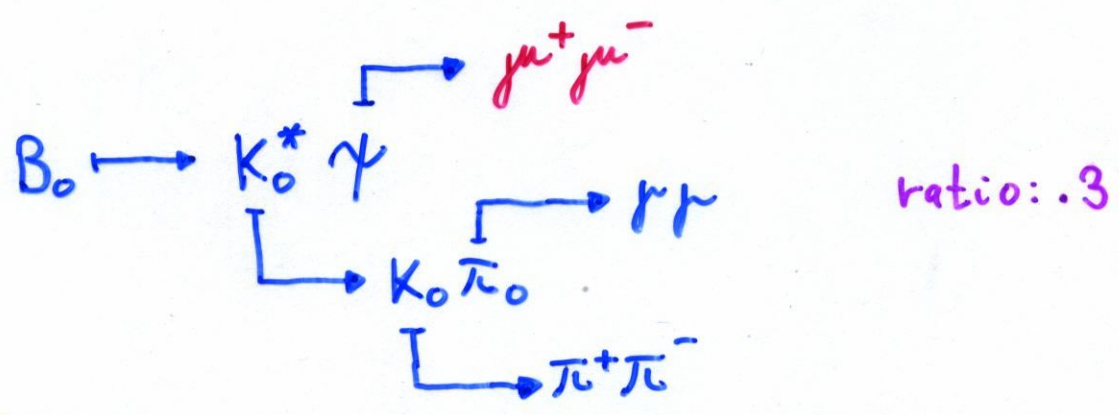
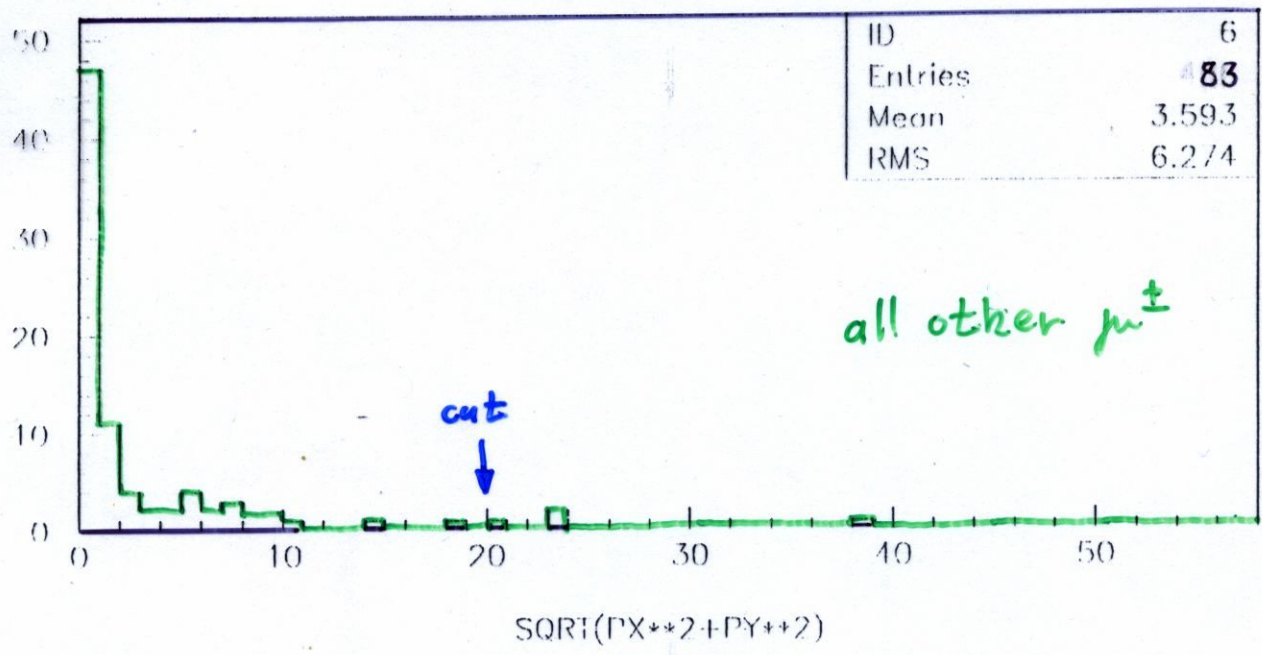
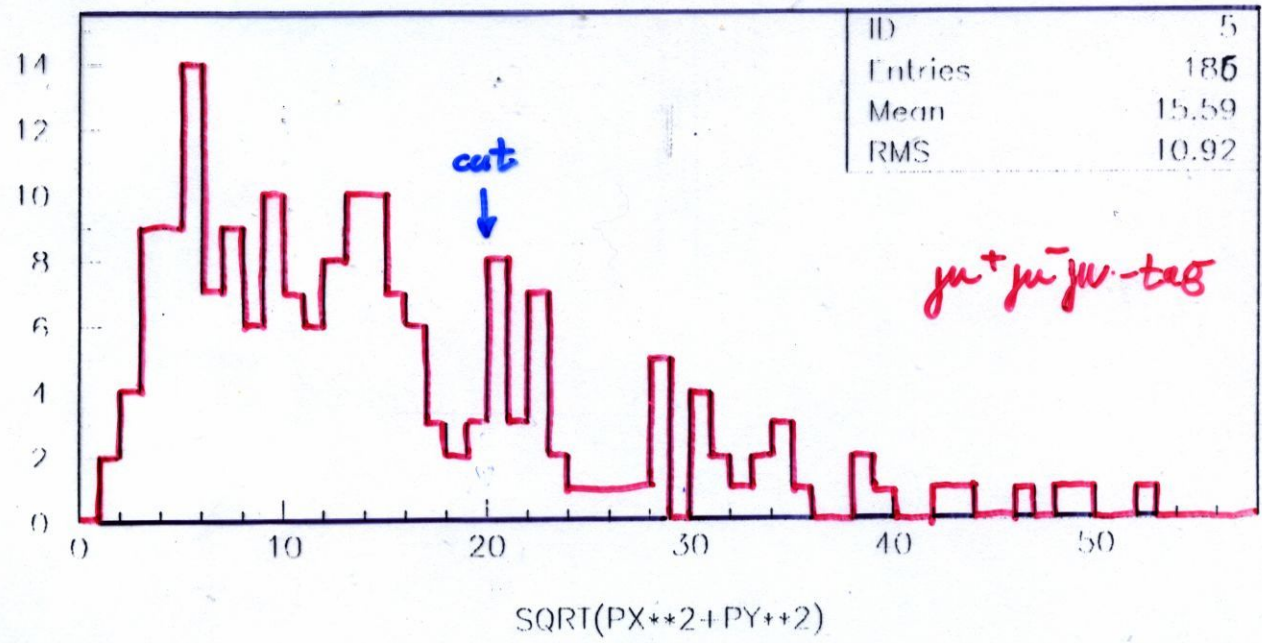


error:  $\epsilon_0 = \epsilon / D$

$D = .77$

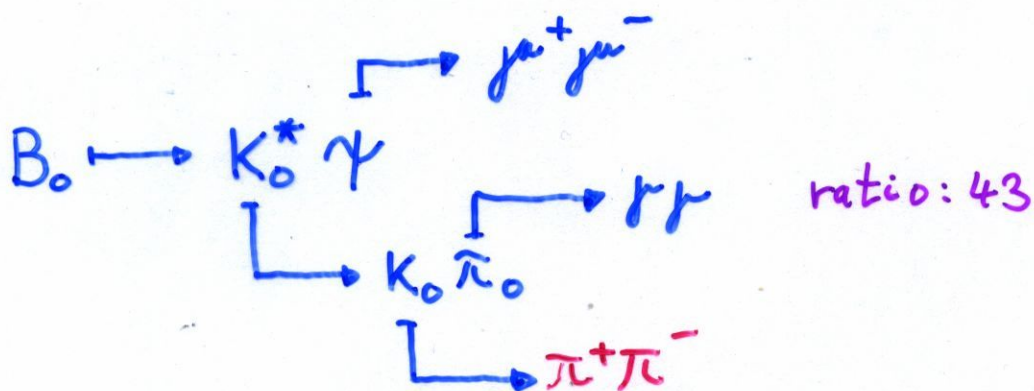
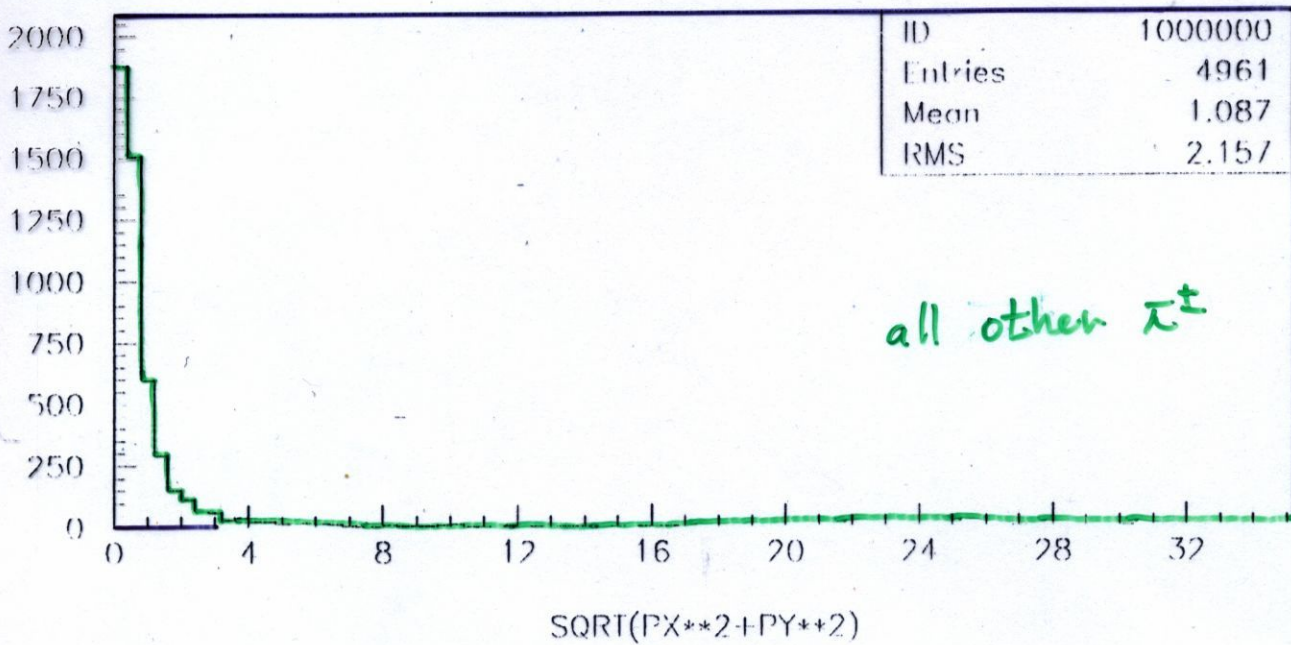
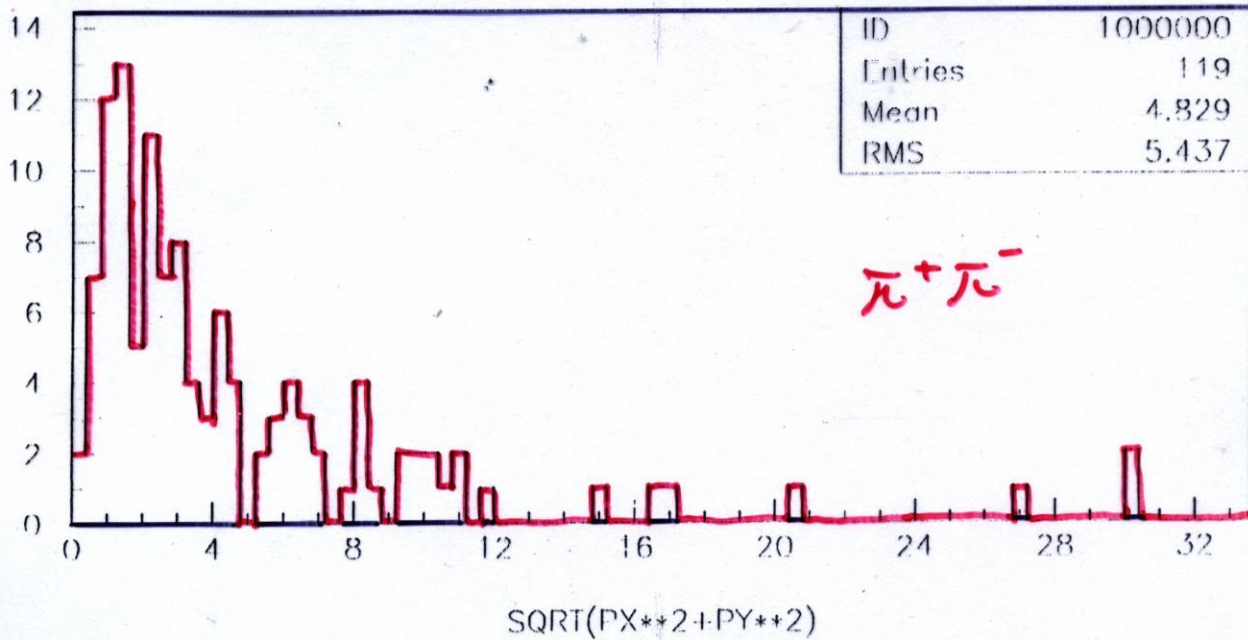
$p_{\mu}^{\pm}$

29/07/92 21.00



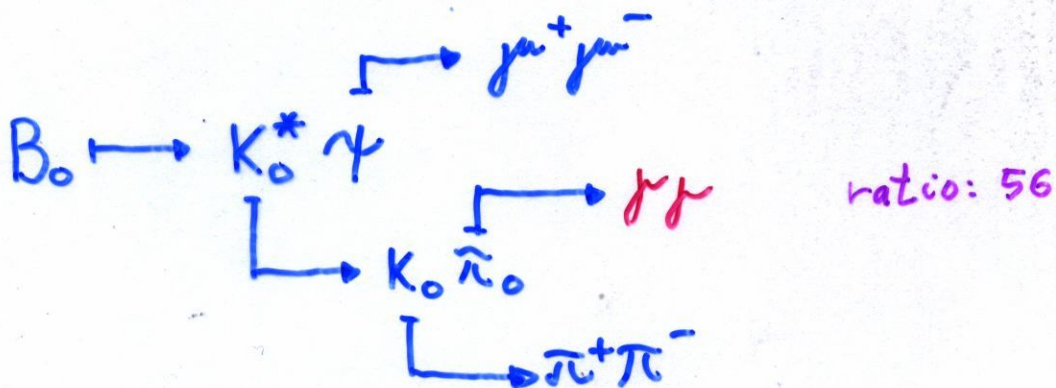
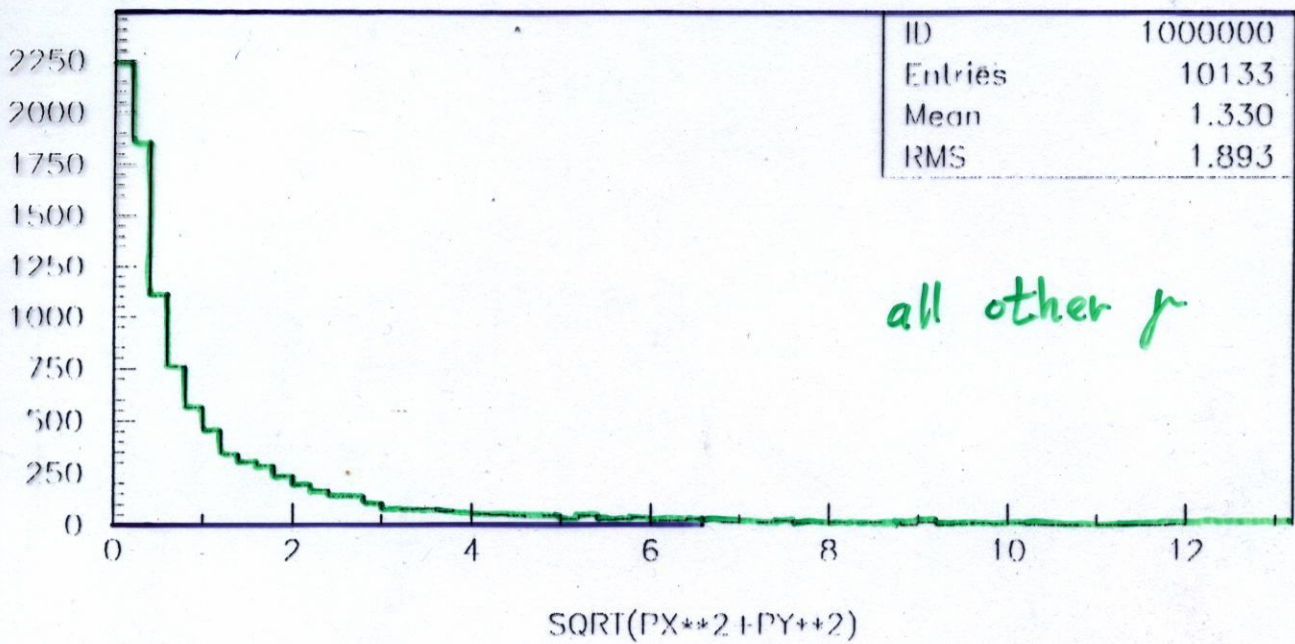
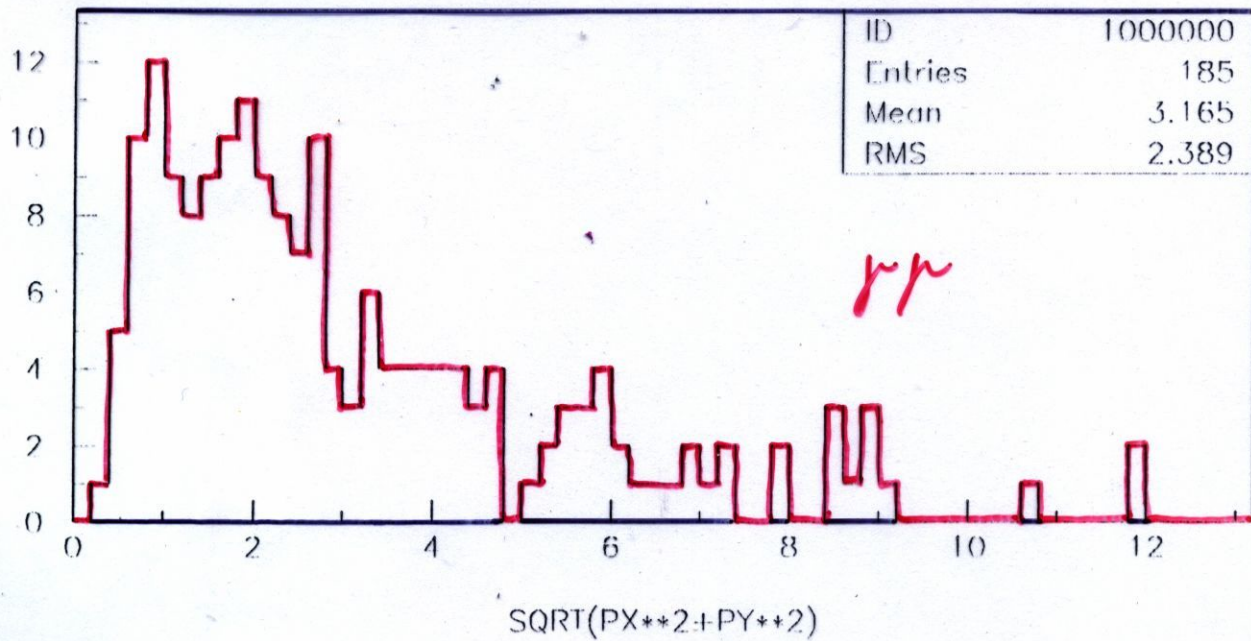
$p_{\pi^{\pm}}$

29/07/92 17.20

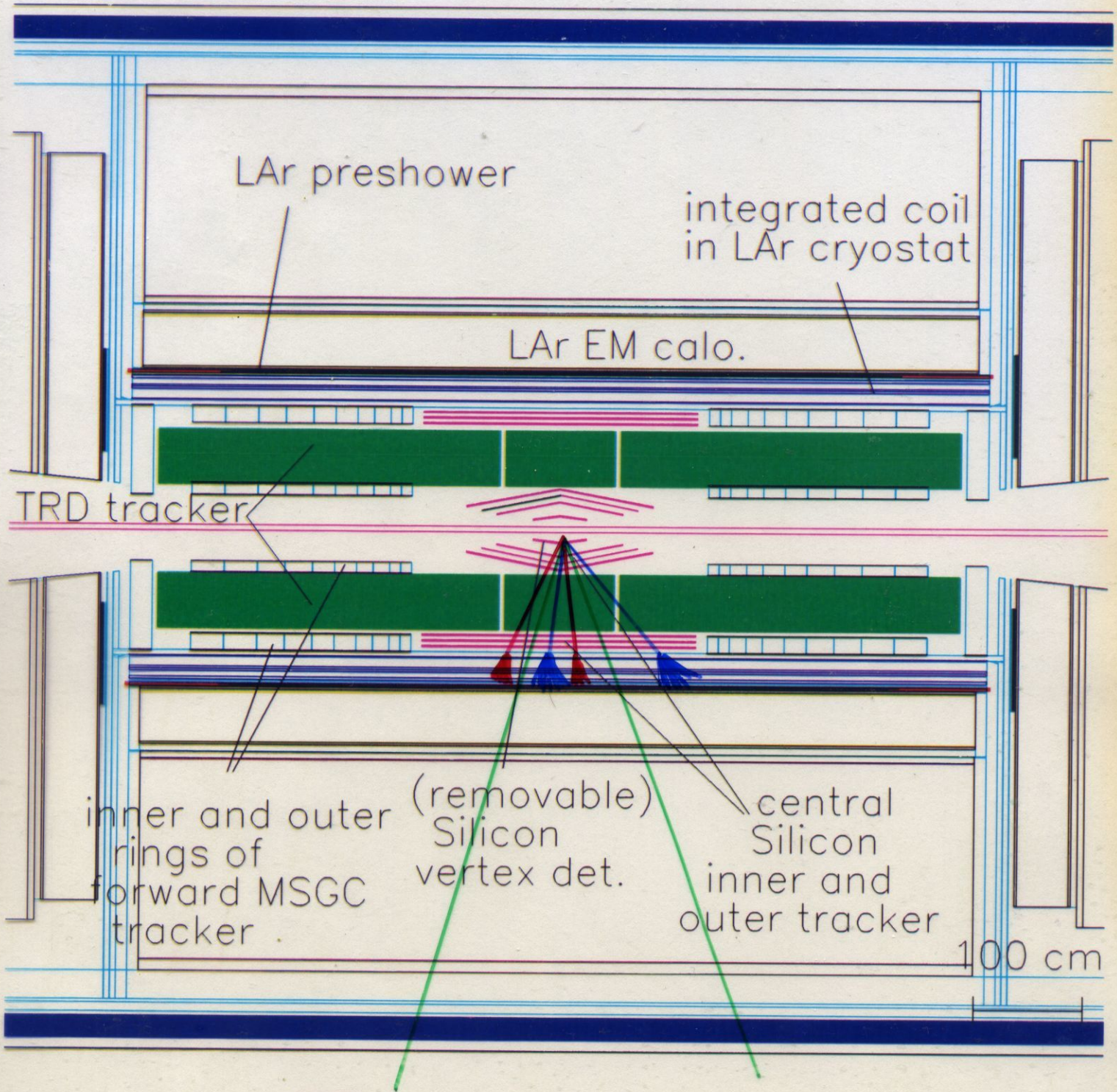


PE

29/07/97 19.55



Eagle



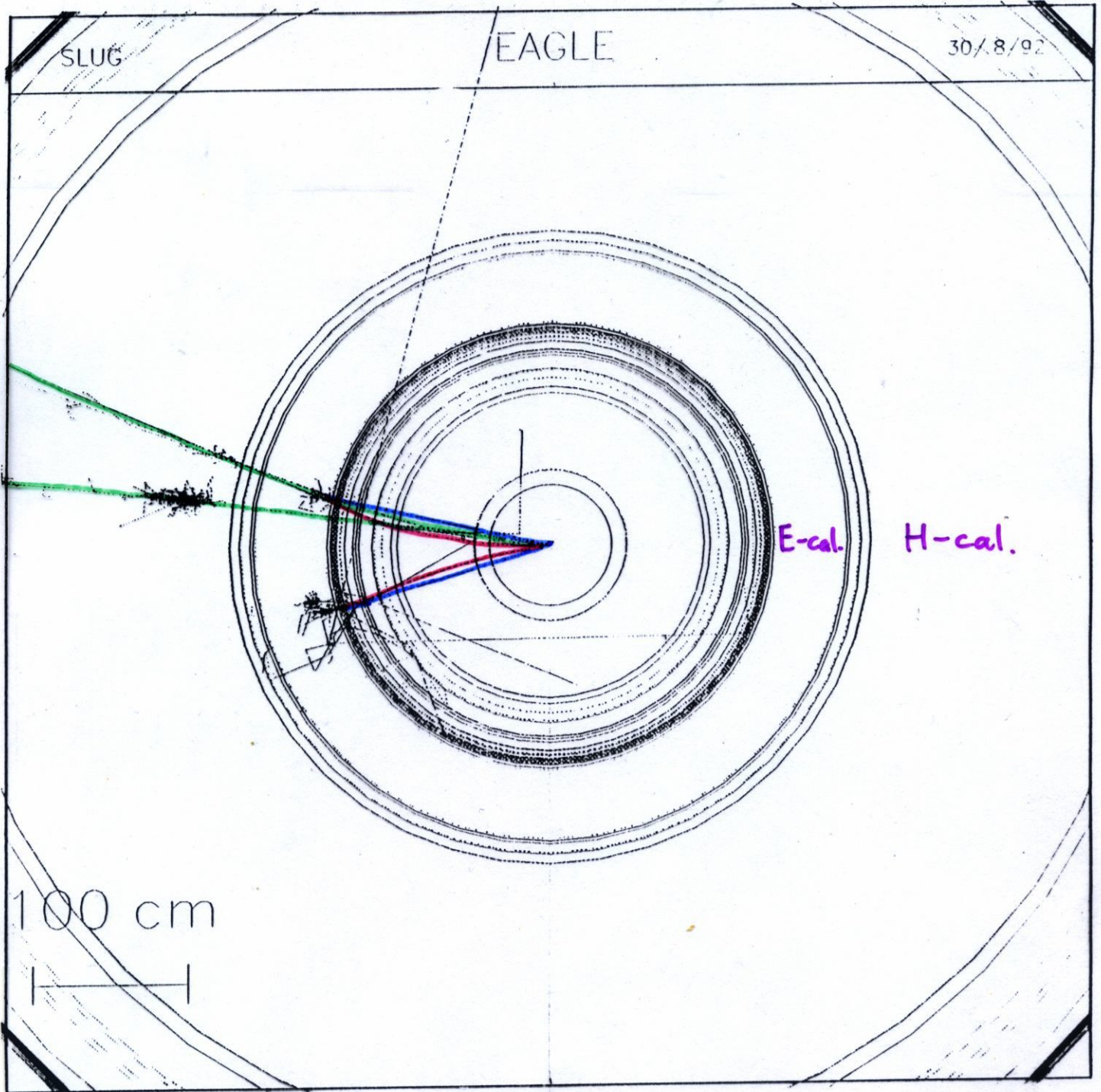
Eagle

$\mu$   
 $\pi^\pm$   
 $\eta^\pm$



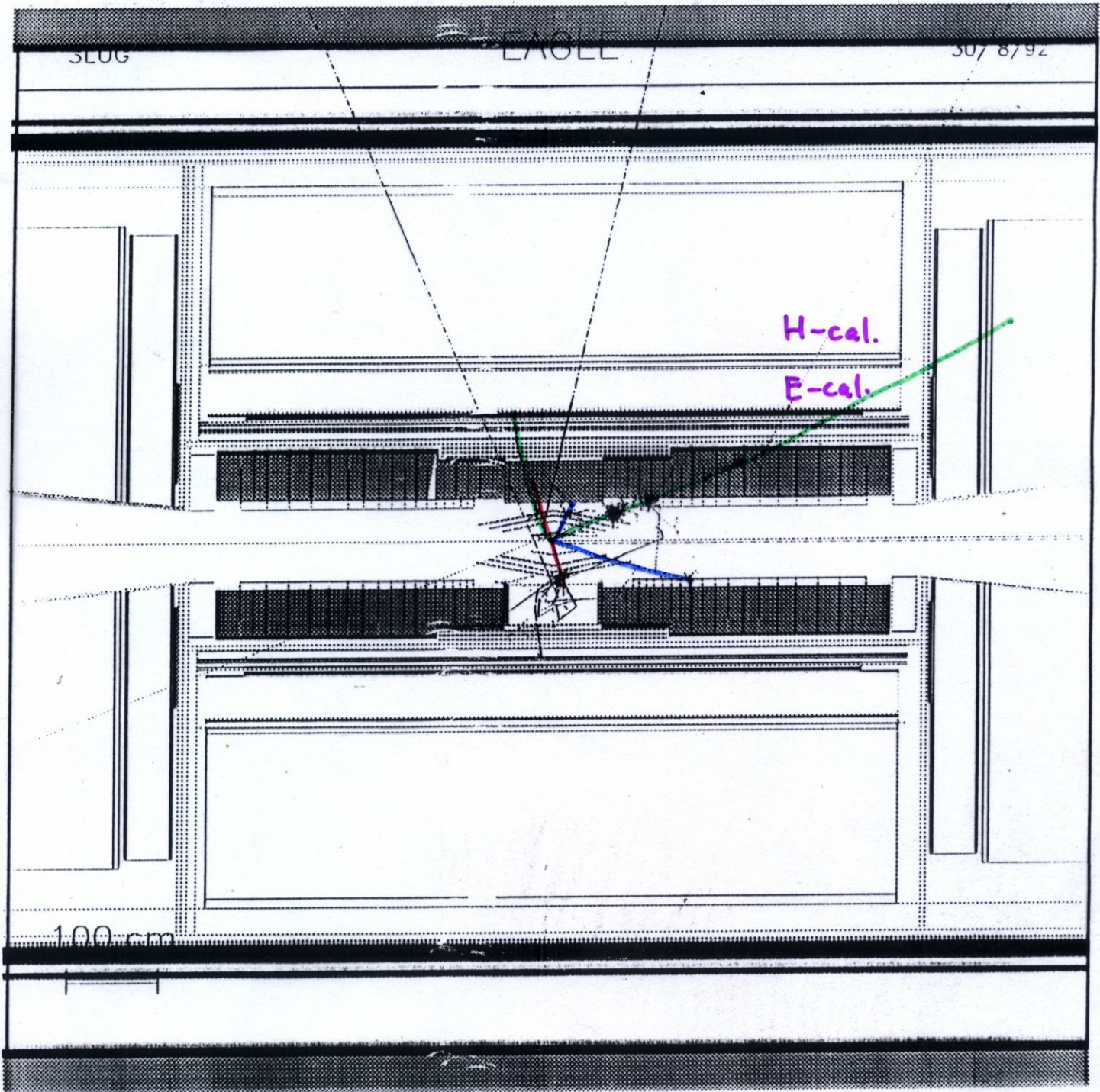
Sample event: xy

$\mu$   $\pi^\pm$   $\mu^\pm$



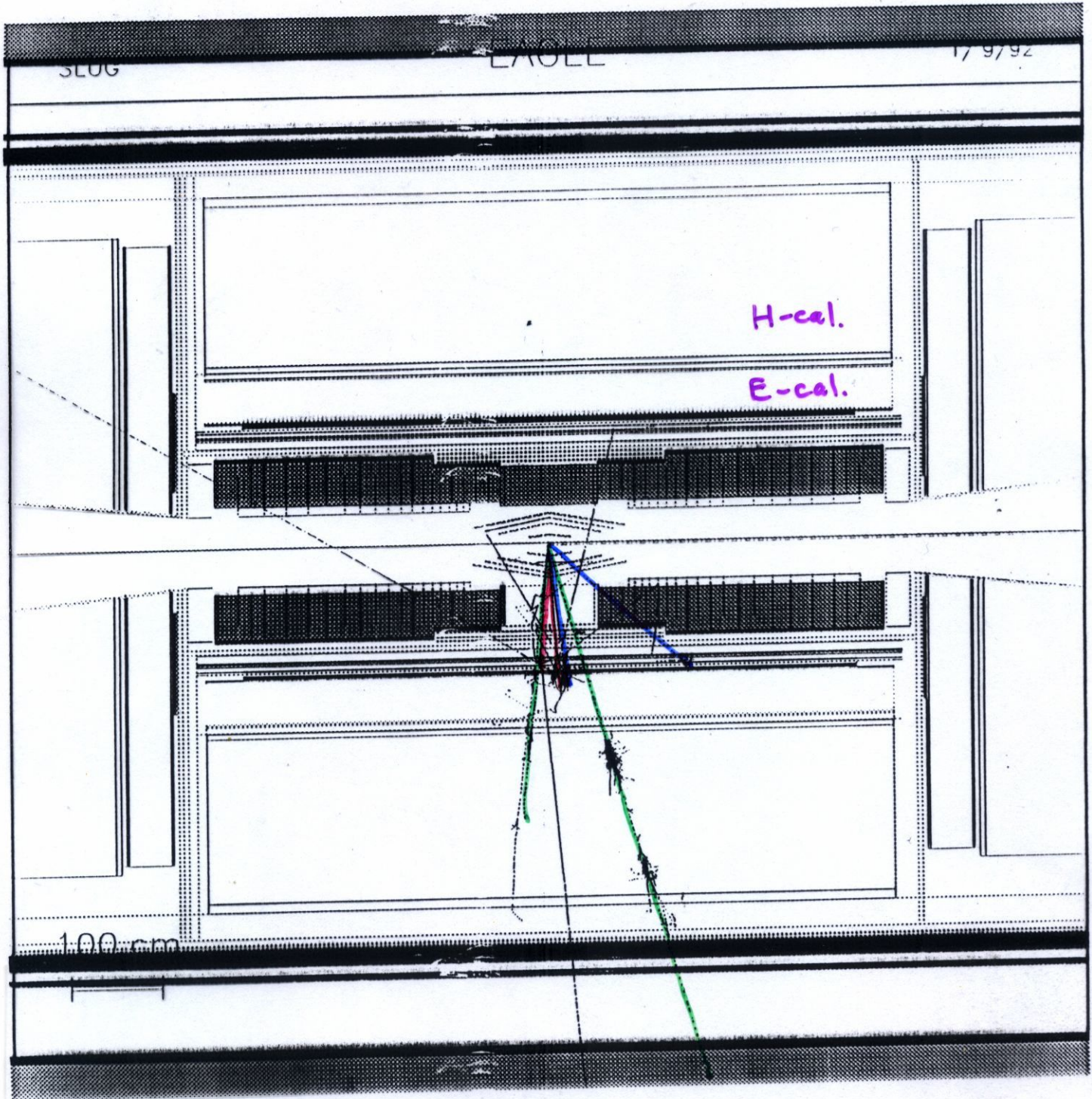
Sample event:  $xz$

$\mu$   $\pi^{\pm}$   $\mu^{\pm}$



Sample event:  $\gamma z$

$\mu^{\pm}$   $\pi^{\pm}$   $\mu^{\pm}$



Full event

SLUG

EAGLE

1/8/92

