Current Status of A_e

Analysis.

Reanalysing
using latest Exp & Pol. #
by EW group.

3/3/2000
T. Abe.

'96 ... $|\cos\theta| < 0.80$

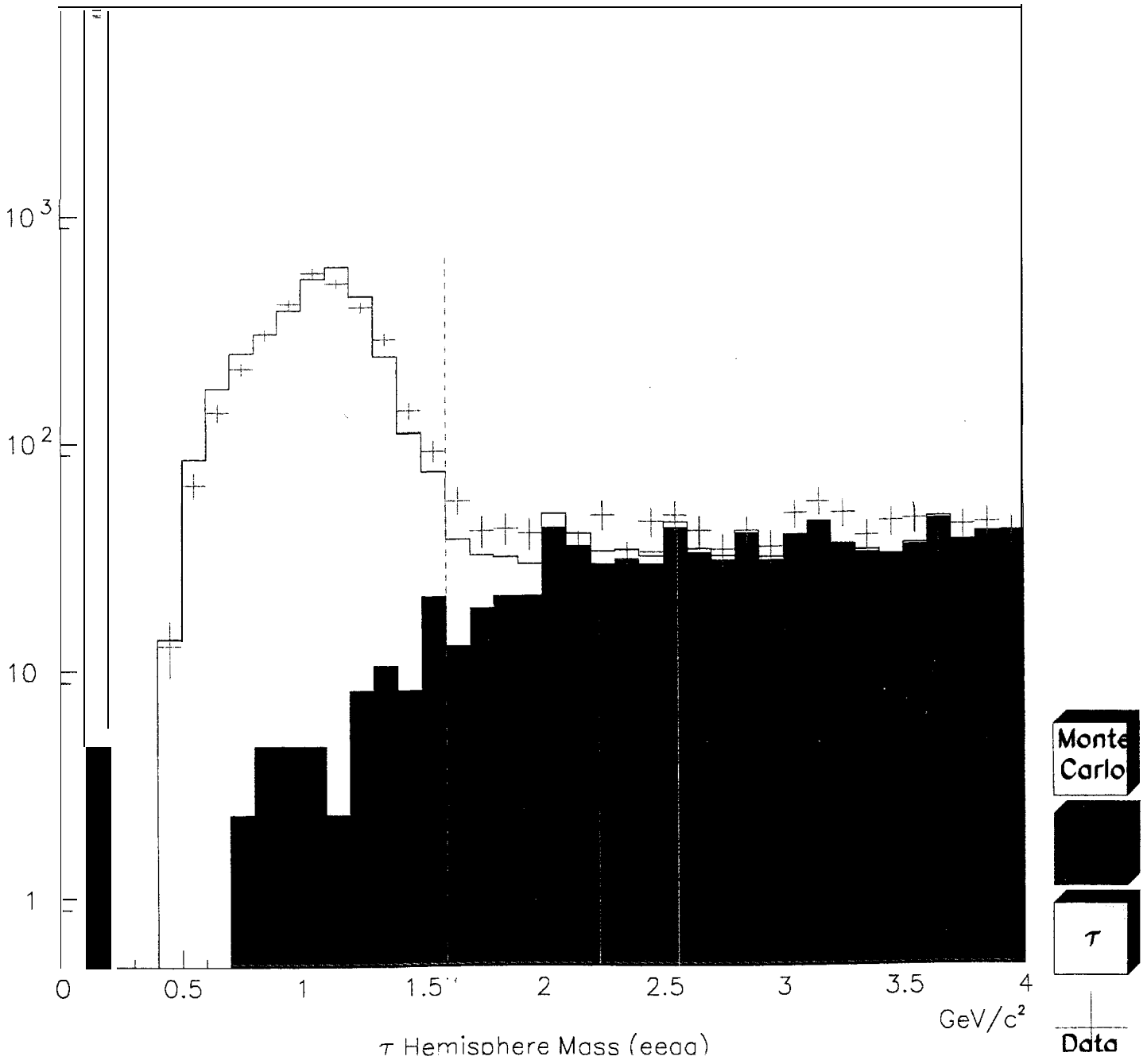
'97-'98 ... $|\cos\theta| < 0.90$

- Some selection criteria was changed to keep high π^0 (for τ sample).
- A_e (without correction) was obtained.

No.2

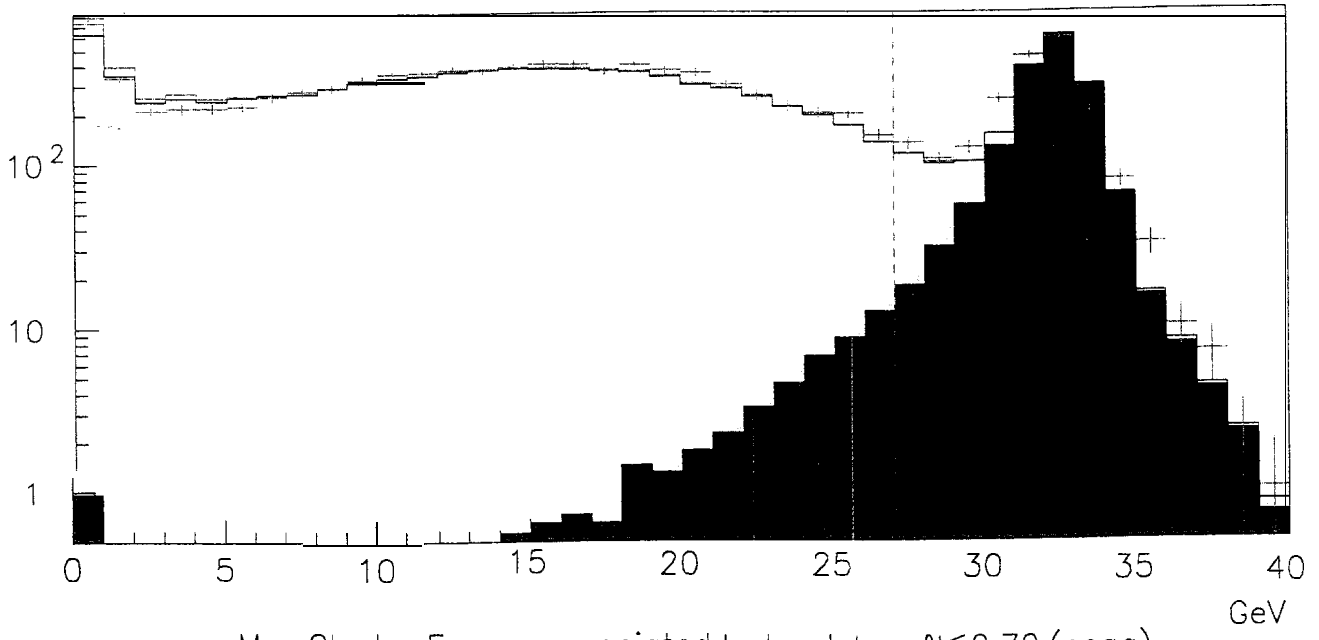
cut hemi mass > 1.6 GeV
(> 1.8 GeV used to be ...)

cut: Hemisphere Mass (Hadron)

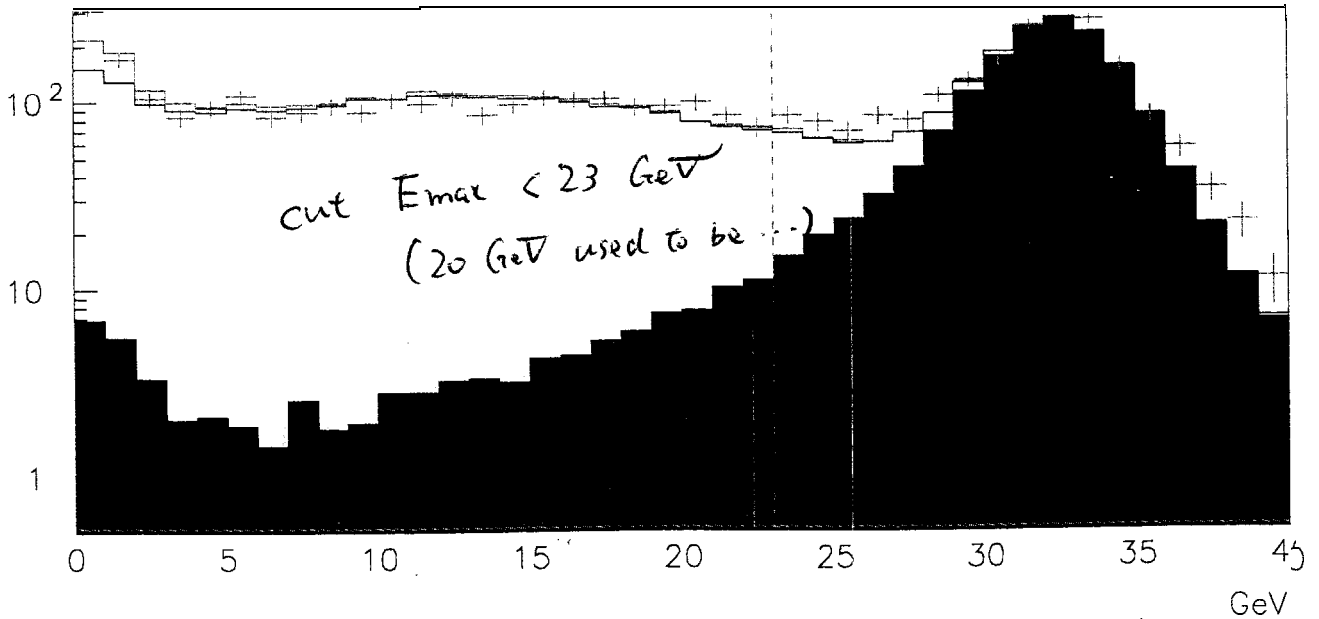


No 3

τ cut: max. Energy (WAB)



τ Max Cluster Energy associated to track $|\cos\vartheta| \leq 0.70$ (eeqq)

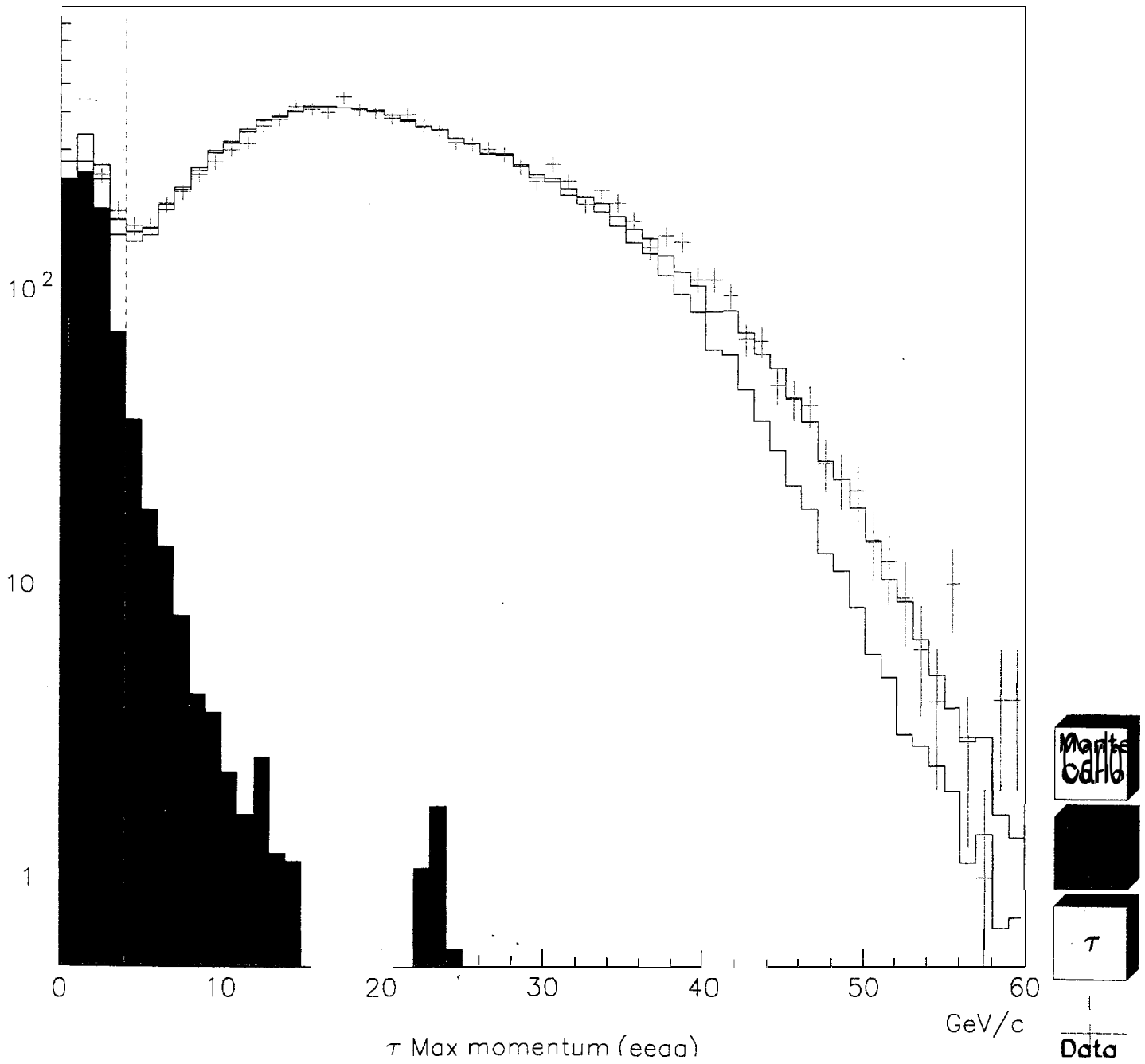


τ Max Cluster Energy associated to track $|\cos\vartheta| \geq 0.70$ (eeqq)

cut $P_{max} < 4$ GeV

(3 GeV used to be ...)

τ cut: Max momentum ($\gamma\gamma$)



'97-'98.

NO. 2.
5

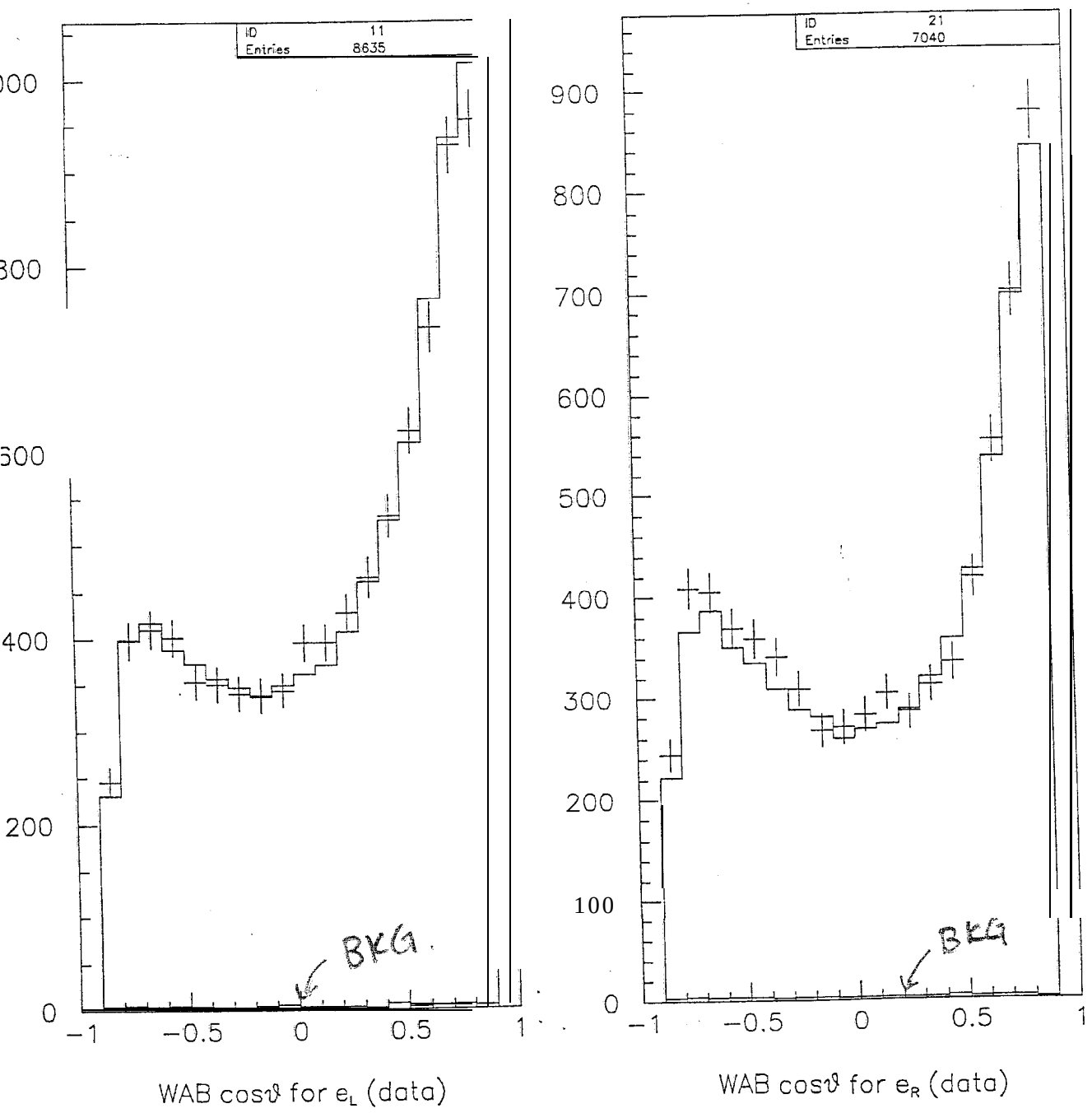
# of candidates = 15675

ε(|cosθ|<0.9) = 4 %

Π = 99.1%

+ : Data
□ : MC

WAB Angular Distribution



97-98

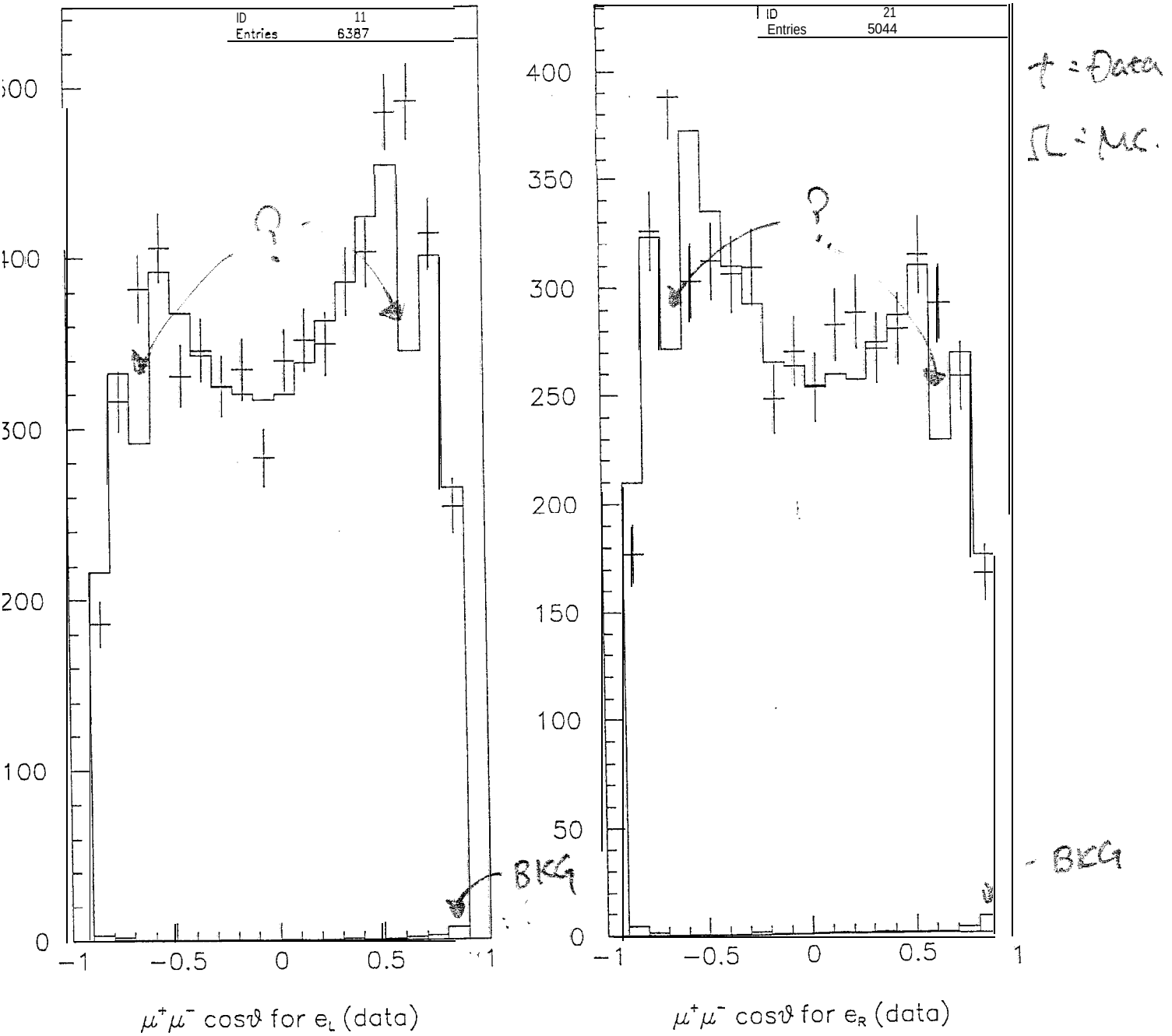
No. 3
6

# of candidates = 1431

ε (<0.9) = 77%

π = 99.5

$\mu^+\mu^-$ Angular Distribution



97 - 98

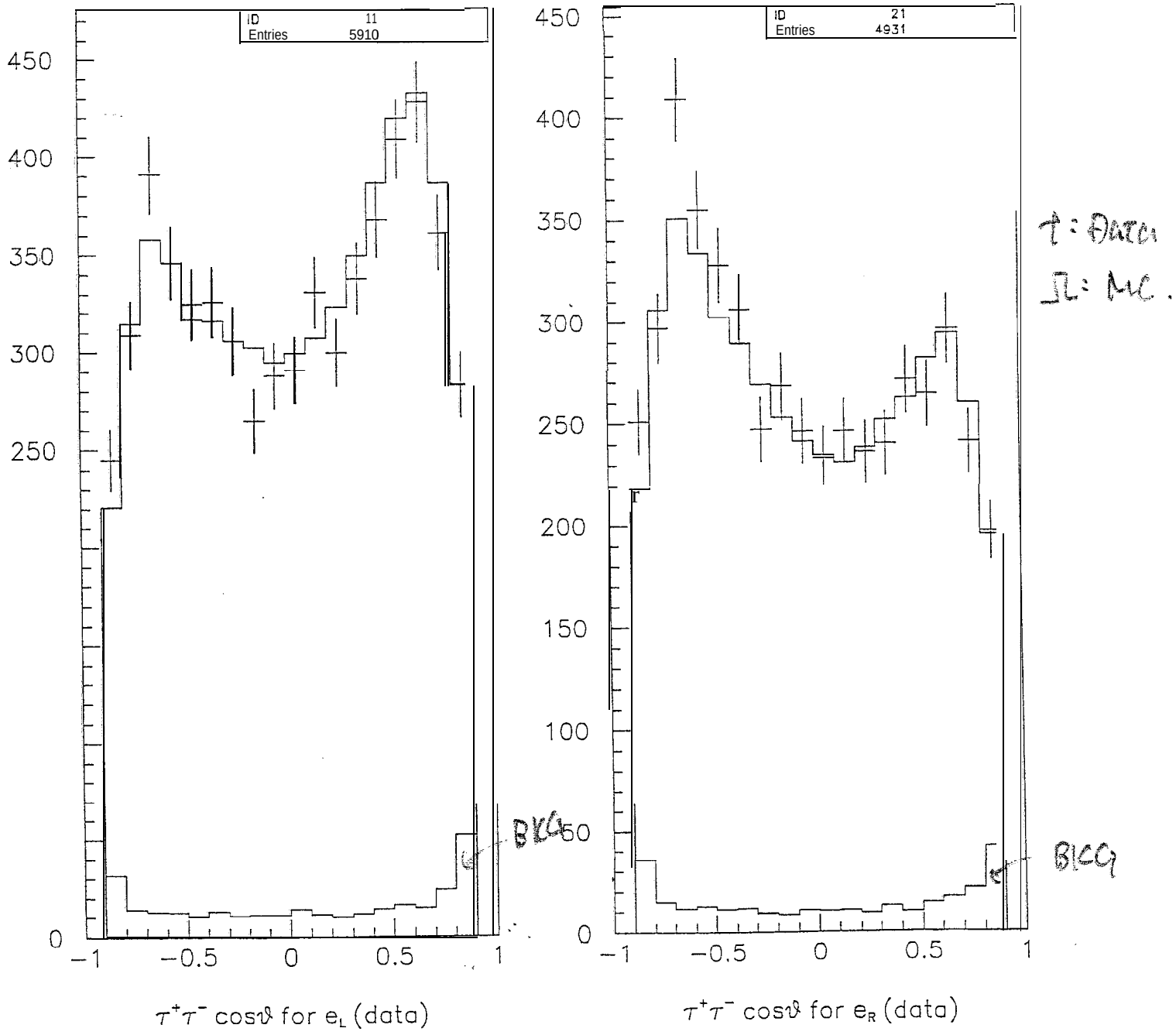
NO. 7

# of candidates = 5910

$\varepsilon(\cos\theta < 0.9)$ = 70.0%

η = 94.5%

$\tau^+\tau^-$ Angular Distribution



Background.

Toy MC (Signal) — events

Toy MC (Big)

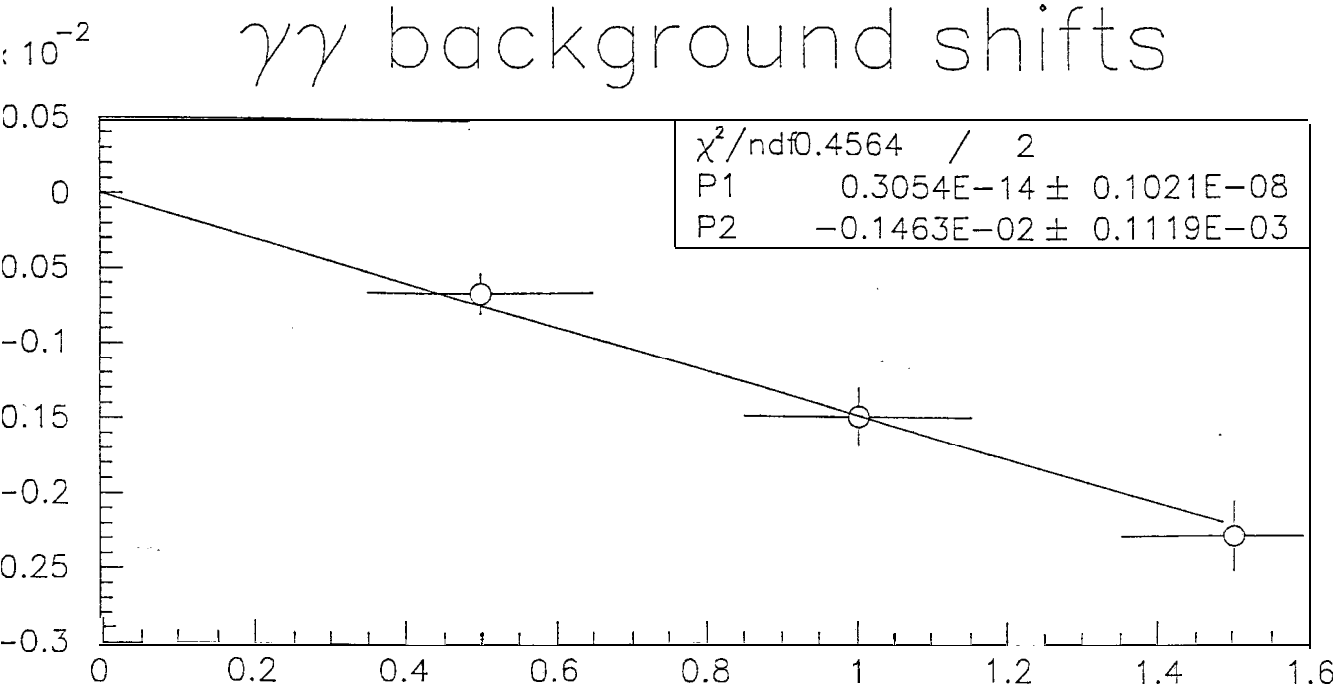
0.5%
1.0%
1.5%

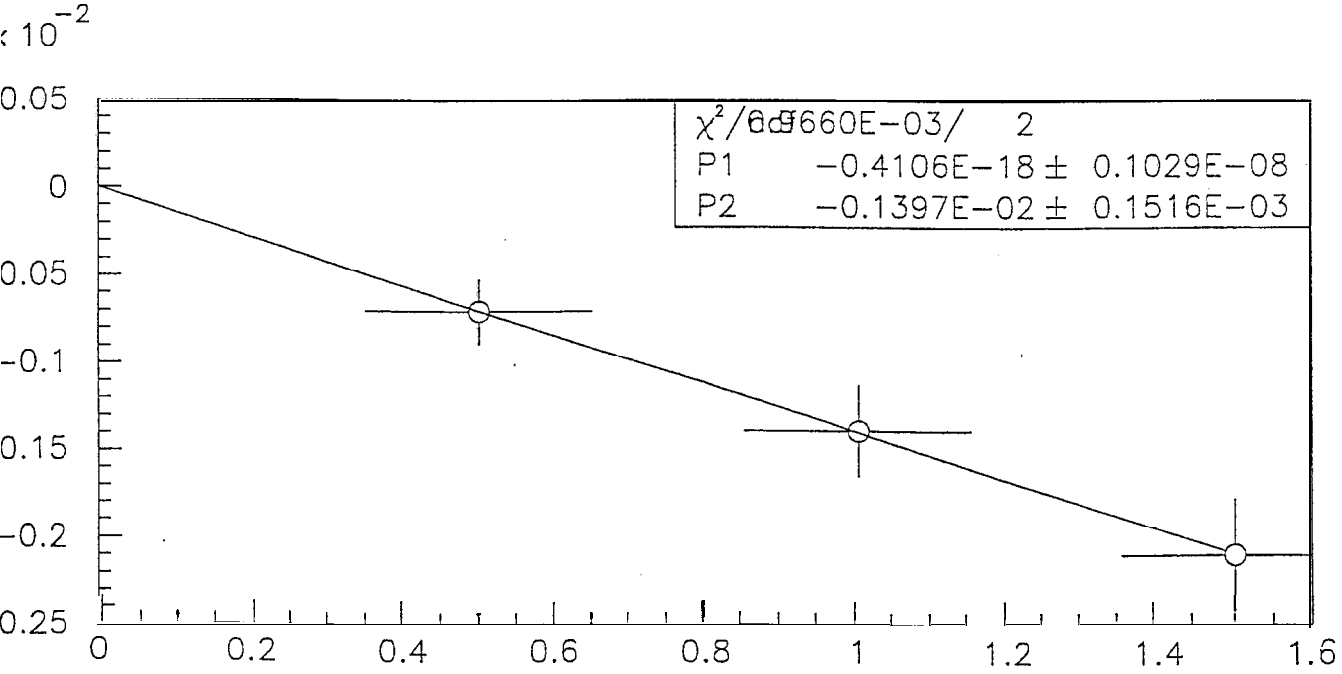
Label level

See the difference.

e^+e^-	e^+e^-	98.2%
	$\mu^+\mu^-$	0.7%
$\gamma^*\gamma^*$	e^+e^-	0.9%
	had.	0.6%
	$\tau\tau$	0.9%
	$\tau^+\tau^-$	98.8%

$\gamma\gamma$ background shifts





$\gamma\gamma$ $f_{rac.}$ = 0.8946

ΔA_e = 13.15 $\times 10^{-4}$

ΔA_τ = 12.53 $\times 10^{-4}$

$P_{conf} = \left(\frac{n_{like}}{n_{unlike}}\right)^2$

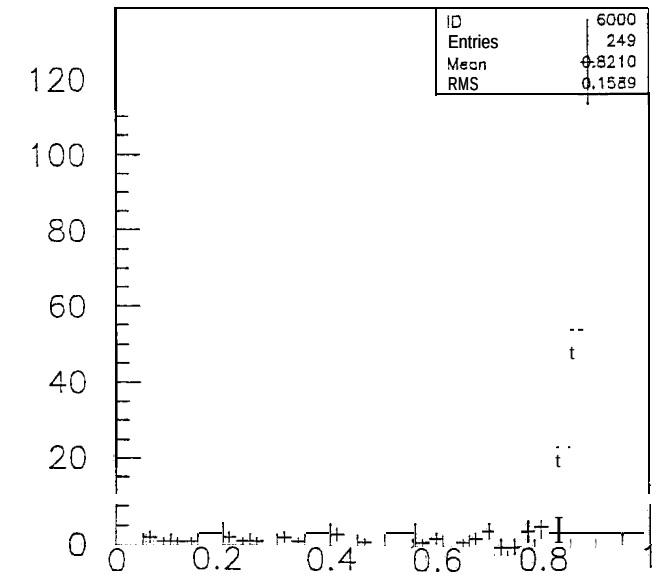
No. 10

→ Toy MC.

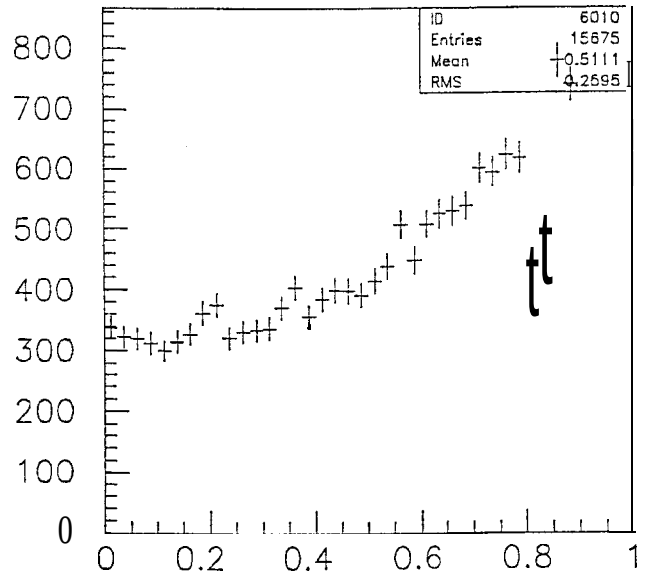
WAB: neg. $\Delta A_{fb} = 7.3 \times 10^{-4}$

$\Delta A_{fb} = 11.4 \times 10^{-4}$

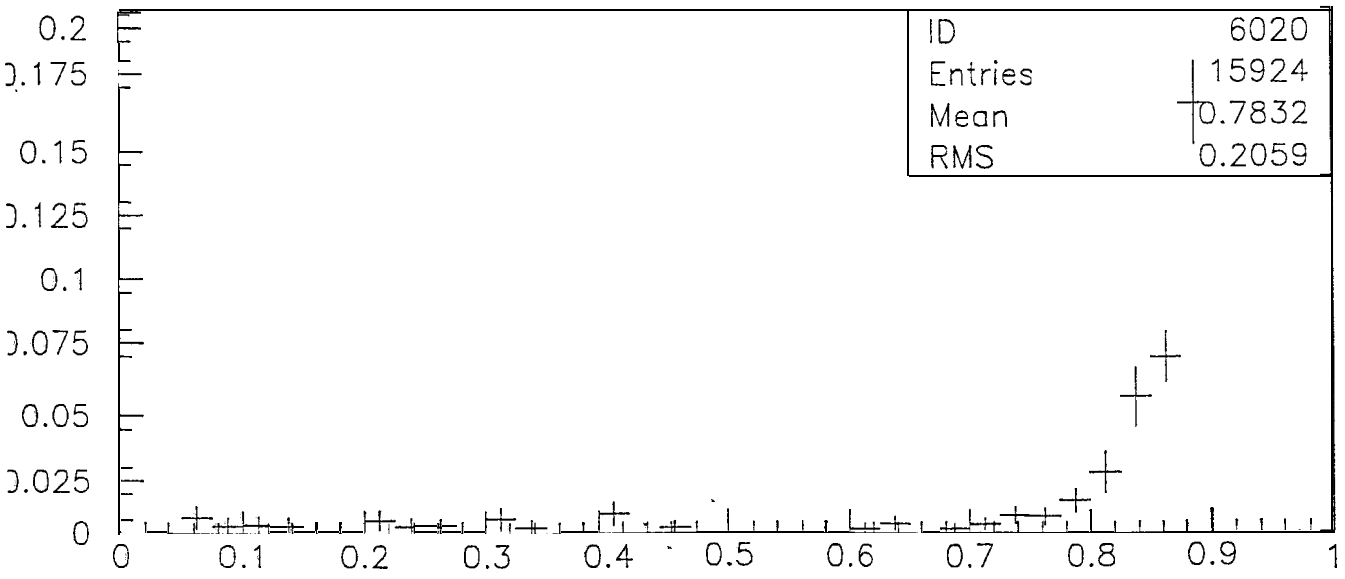
WAB Charge Confusion (Data)



Like−sign WABs vs. cosϑ



UnLike−sign WABs vs. cosϑ



Like−sign/UnLike−sign WABs vs. cosϑ

Updated A_ℓ results (~~1992~~ '96

Systematic Errors. ($\times 10^{-4}$)

	A_e^e	A_e^μ	A_e^τ	A_μ	A_τ
Ecm	±16	±2	±1	±1	±2
Bkg.	±3		±26		±22
V-A					
	±16	±2	±26	±1	±34

A_e^e - $0.1775 \pm 0.0283 \pm 0.0016_{18}$

A_e^μ $0.1326 \pm 0.0326 \pm 0.0002_{8}$

A_e^τ $0.1309 \pm 0.0341 \pm 0.0026_{27}$

$A_\mu = 0.1653 \pm 0.0467 \pm 0.0001_{8}$

$A_\tau = 0.0758 \pm 0.0484 \pm 0.0034_{35}$

$\pm \delta_{pol.}$ (±0.0009)

Updated A_ℓ results ('97 - '98).

Systematic Errors ($\times 10^{-4}$)

	A_e^e	A_e^μ	A_e^τ	A_μ	A_τ
Rad.	±23	±2	±2	±3	±2
Bks.	±5	~~±2~~	±13		±~~30~~ 14
V-A					±30
Charge Conf.				±7	±11
	±24.	±2	±14	±8	±35

$$A_e^e = 0.1718 \pm 0.0111 \pm 0.0023^{24}$$

$$A_e^\mu = 0.1645 \pm 0.0128 \pm 0.0002^{8}.$$

$$A_e^\tau = 0.1248 \pm 0.0132 \pm 0.0014^{16}$$

$$A_\mu = 0.1495 \pm 0.0176 \pm 0.0008^{11}$$

$$A_\tau = 0.1334 \pm 0.0179 \pm 0.0035^{86}$$

$\left.\right\} \pm \delta_{pol.}$ ± 0.0008

combined δA_ℓ (stat.) $\sim 0.00^{51}$~~58~~

$\sim \delta \sin^2\theta_W$ (stat.) $\simeq 0.00065$