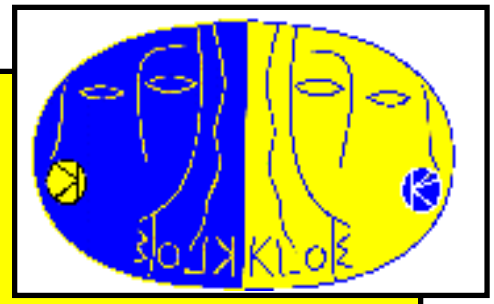


Status report on $\phi \to \eta' \gamma$

Camilla Di Donato

I.N.F.N. Napoli

Frascati 13/02/2003

Summary

- 2000: ~17 pb-1
- 2001: ~108 pb-1
- 2002: ~223 pb-1

2000

KLOE memo n.268:
update at the end of feb.

- time window = min($5\sigma_t$,2ns)
- EMC-MC threshold
- time calibration 2000 data
- accidentals in DC (mbckadd)
- input kin.fit: pull
- more stat. mc background
- cut on $\cos\theta_{\pi\pi}<-0.9$ removed

$K_S \rightarrow \pi^+\pi^-$
$K_L \rightarrow \pi^0\pi^0\pi^0$

2000

New mc efficiency:

	ε		
SGN	20.46%	s/b	N
BG1	$1{,}93\times10^{-7}$ (90% c.l.)	>252	<0,5
BG2	$2{,}75\times10^{-5}$	6	20
BG3	29×10^{-5}	24	5,5

N(2000) = 179 (no bg subtracted)

$N\eta'\gamma$ = N(2000)-Nbg = 179 – 25.5 = 153.5

2000

Systematics:

	$\Delta\varepsilon/\varepsilon$
filfo	1.1%
evcl	1.75%
vertex	1.4%
Total	**2.5%**

	$\Delta(N/\varepsilon)\ /(N/\varepsilon)$
Δz $=\pm 15\%$	$\pm 0.4\%$
$\Delta\theta$ $=\pm 1^\circ$	$\pm 4\%$
ΔE $=\pm 10\%$	$-0.4\%/+3.0\%$
χ^2/Ndof (± 1)	$-0.4\%/+2.5\%$
Total	**$-4\%/+6\%$**

2000

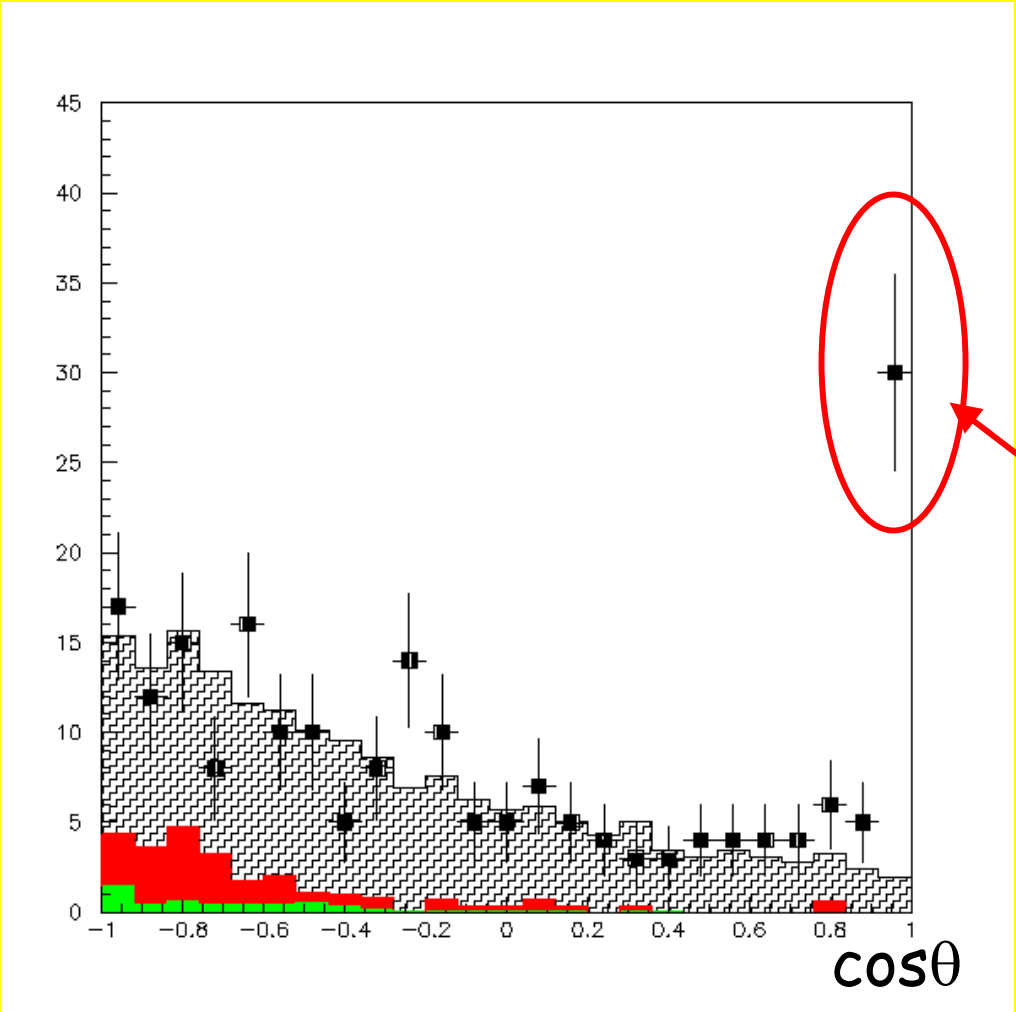
Systematics:

BR''	3%
luminosity	1%-2%
cross section	2.5%
total	4.5%

$$BR(\phi \to \eta' \gamma) = (7{,}05 \pm 0{,}50\ ^{+0{,}53}_{-0{,}46}) \times 10^{-5}$$

P.L.B541(2002): $BR(\phi \to \eta' \gamma) = (6{,}10 \pm 0{,}61 \pm 0{,}43) \times 10^{-5}$

2000



$K_S \rightarrow \pi^0 \pi^0$

$K_L \rightarrow \pi^+\pi^-\pi^0$

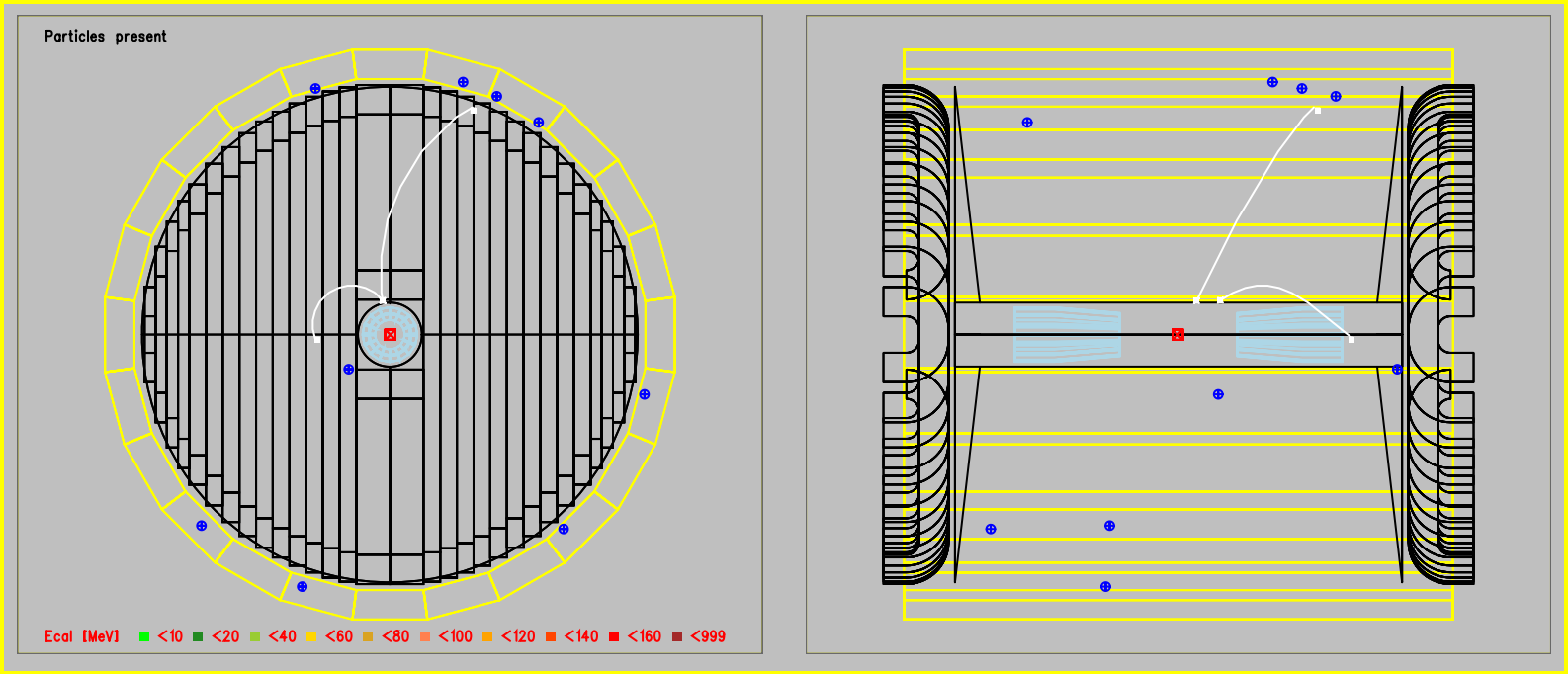
$K_S \rightarrow \pi^+\pi^-\gamma$

$K_L \rightarrow \pi^0\pi^0\pi^0$

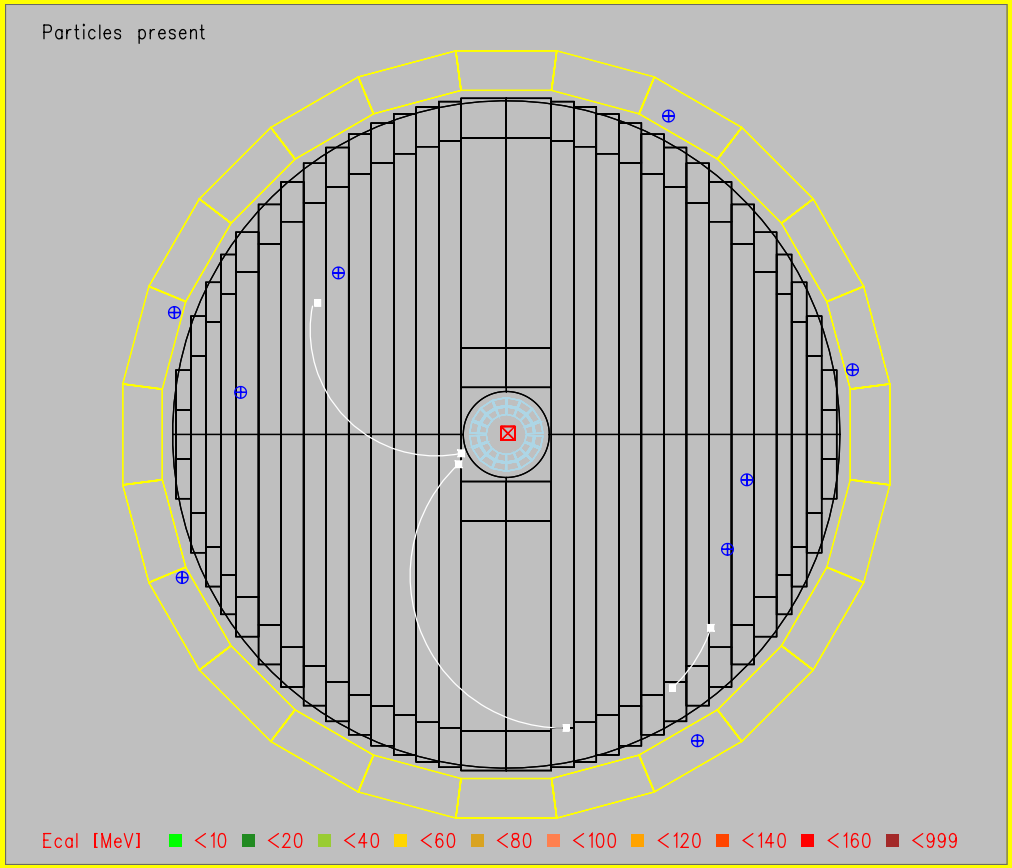
- **data**

BACKGROUND

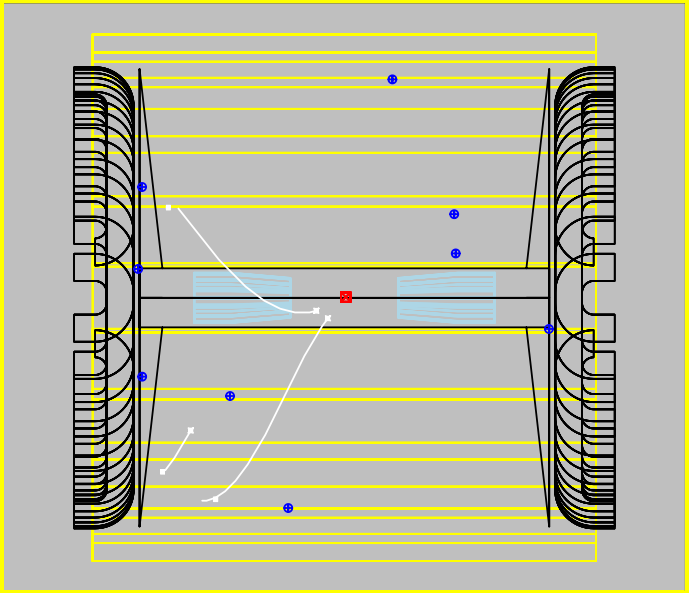
2000

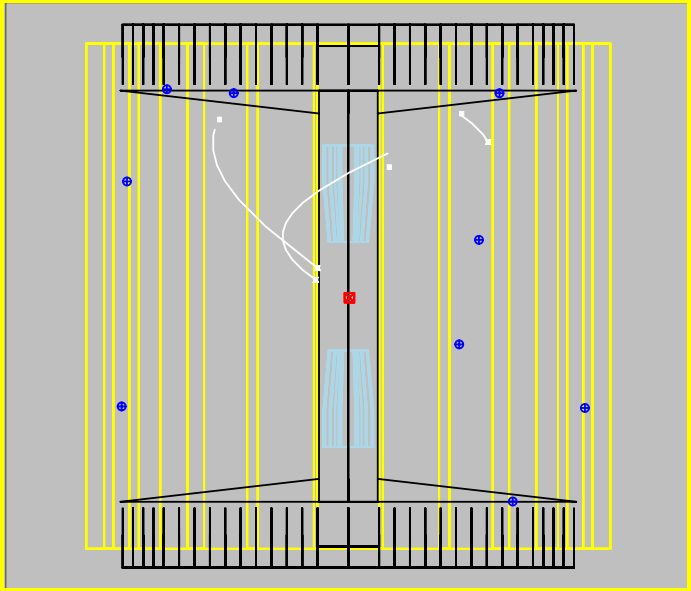


2000

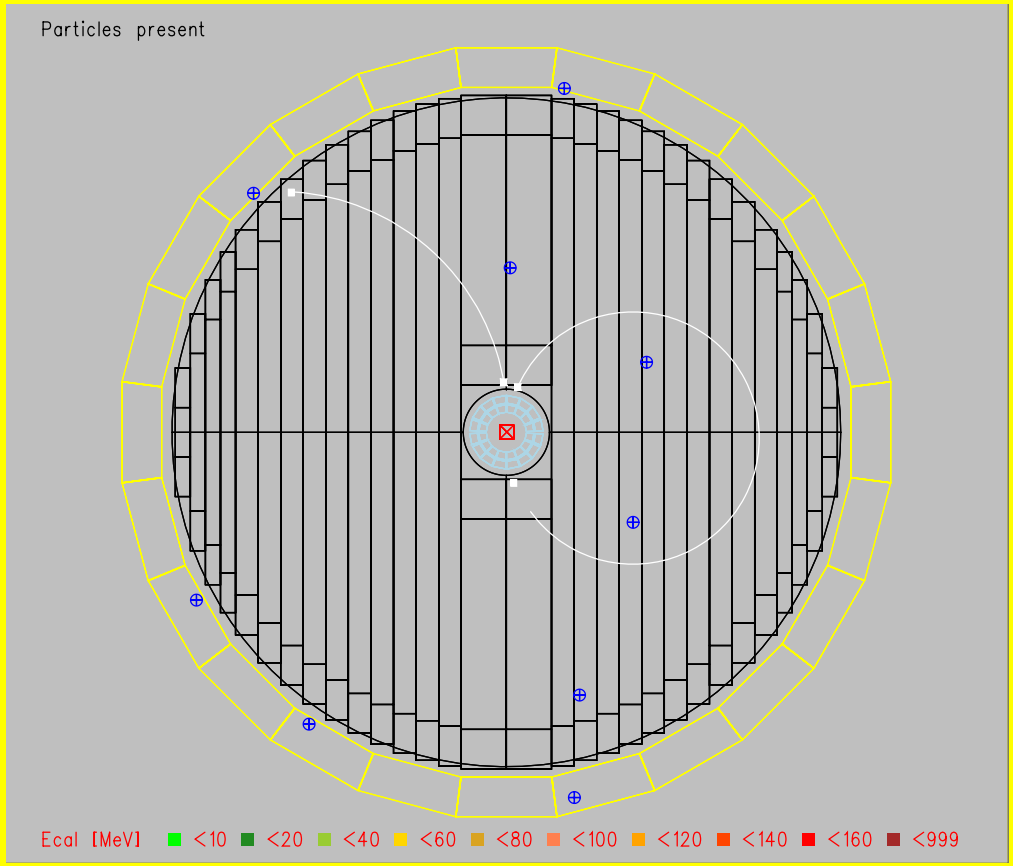


2000

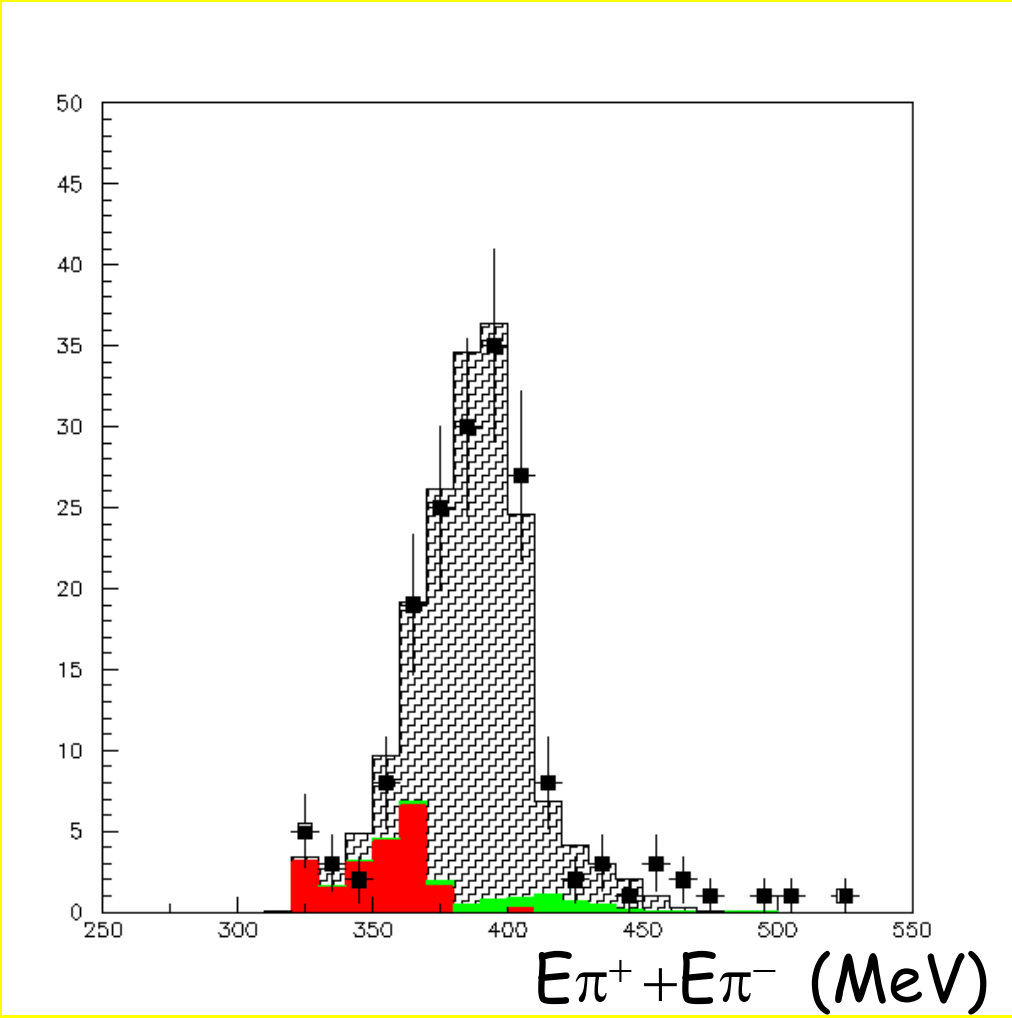




2000



2000



$K_S \rightarrow \pi^0 \pi^0$

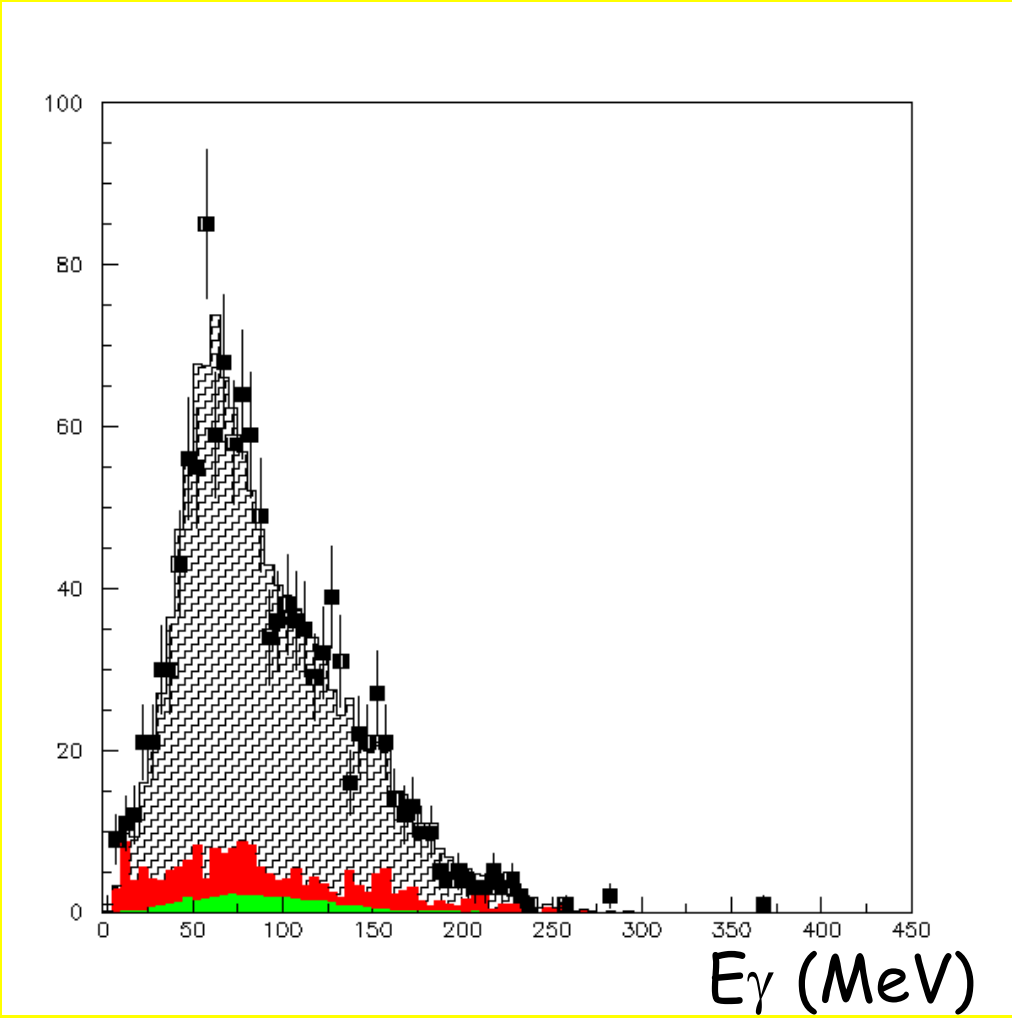
$K_L \rightarrow \pi^+\pi^-\pi^0$

$K_S \rightarrow \pi^+\pi^-\gamma$

$K_L \rightarrow \pi^0\pi^0\pi^0$

- **data**

2000



$K_S \rightarrow \pi^0 \pi^0$

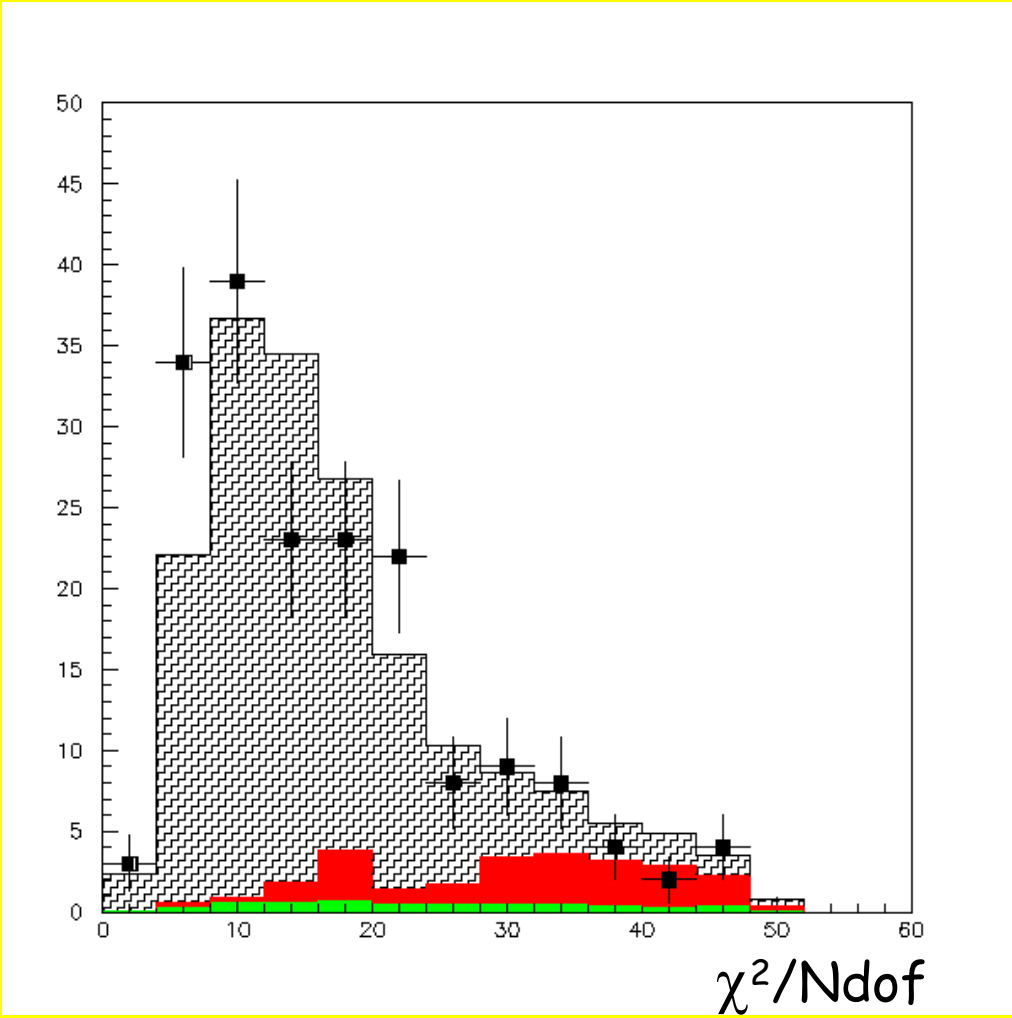
$K_L \rightarrow \pi^+\pi^-\pi^0$

$K_S \rightarrow \pi^+\pi^-\gamma$

$K_L \rightarrow \pi^0\pi^0\pi^0$

- **data**

2000



$K_S \rightarrow \pi^0 \pi^0$

$K_L \rightarrow \pi^+\pi^-\pi^0$

$K_S \rightarrow \pi^+\pi^-\gamma$

$K_L \rightarrow \pi^0\pi^0\pi^0$

- **data**

2001

$\mathcal{L}_{int}$ = 108pb-1

$$BR(\phi \rightarrow \eta' \gamma) = (6{,}20 \pm 0{,}19) \times 10^{-5}$$

N(2001) = 1046 (no bg subtracted)

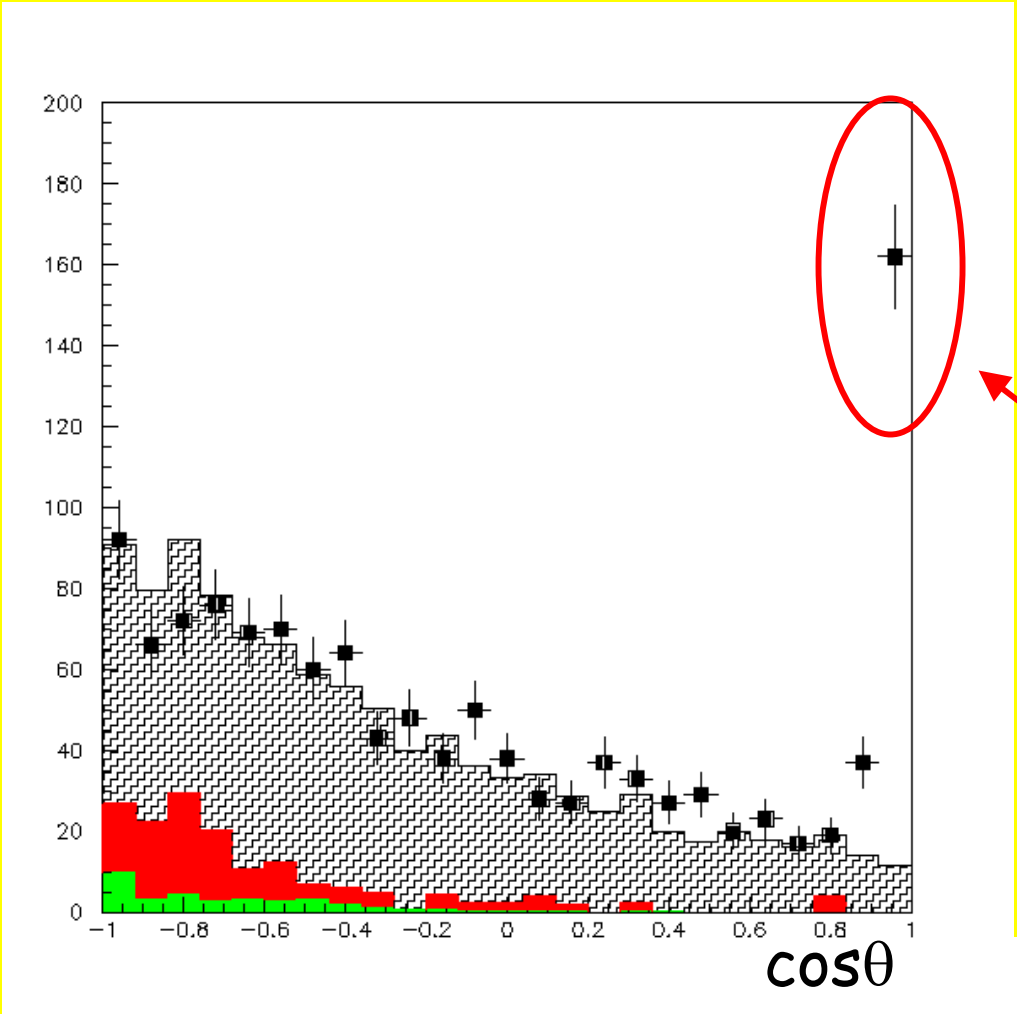
$N_{\eta'\gamma} = N_{(2001)} - N_{bg} = 1046 - 162 = 884$

2001(2)

Systematics:

		$\Delta\varepsilon/\varepsilon$
filfo		-
evcl		-
vertex		-
		$\Delta(N/\varepsilon)\ /(N/\varepsilon)$
Δz	$=\pm 15\%$	-
$\Delta\theta$	$=\pm 1°$	2%
ΔE	$=\pm 10\%$	-
χ^2/Ndof	(± 1)	-0,5%/+1,5%
BR''	3%	
luminosity	1%-2%	
cross section	2.5%	

2001



$K_S \rightarrow \pi^0 \pi^0$

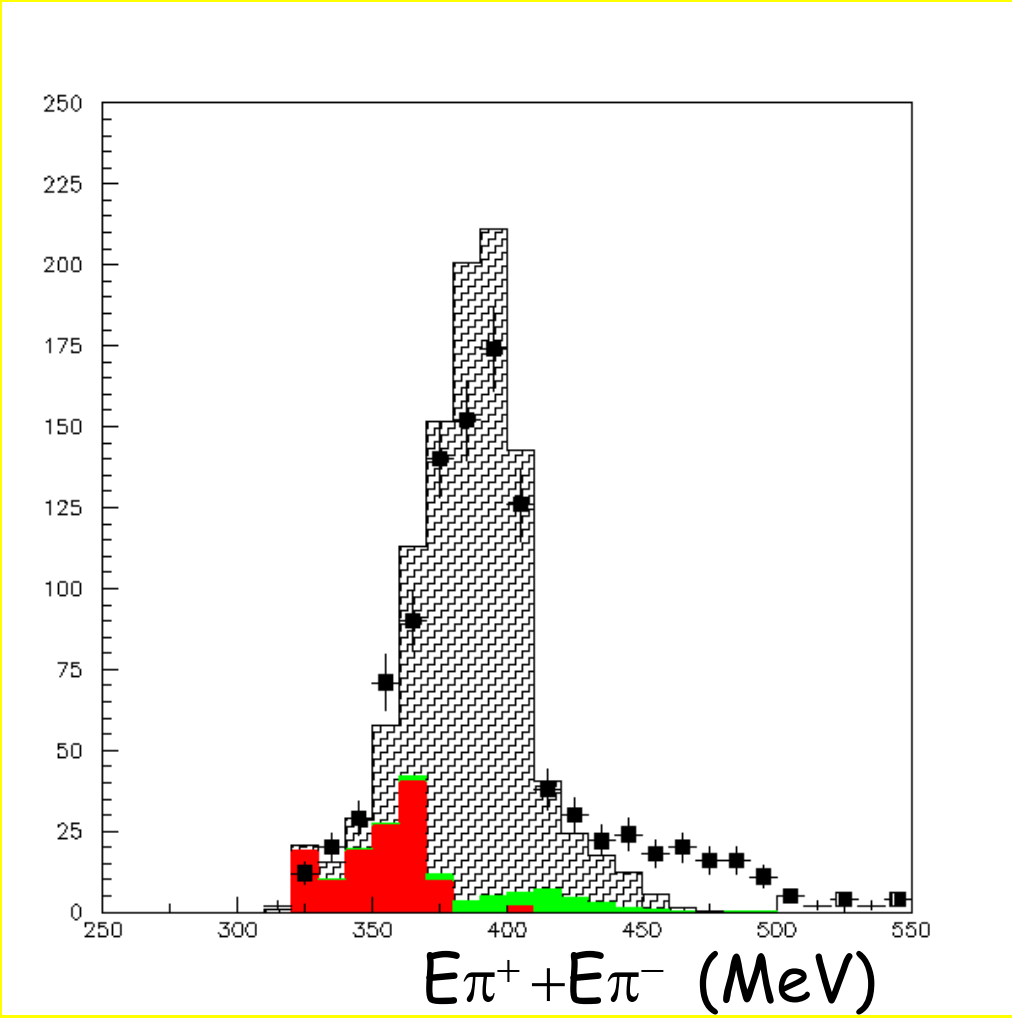
$K_L \rightarrow \pi^+\pi^-\pi^0$

$K_S \rightarrow \pi^+\pi^-\gamma$

$K_L \rightarrow \pi^0\pi^0\pi^0$

- **data**

2001



$K_S \rightarrow \pi^0 \pi^0$

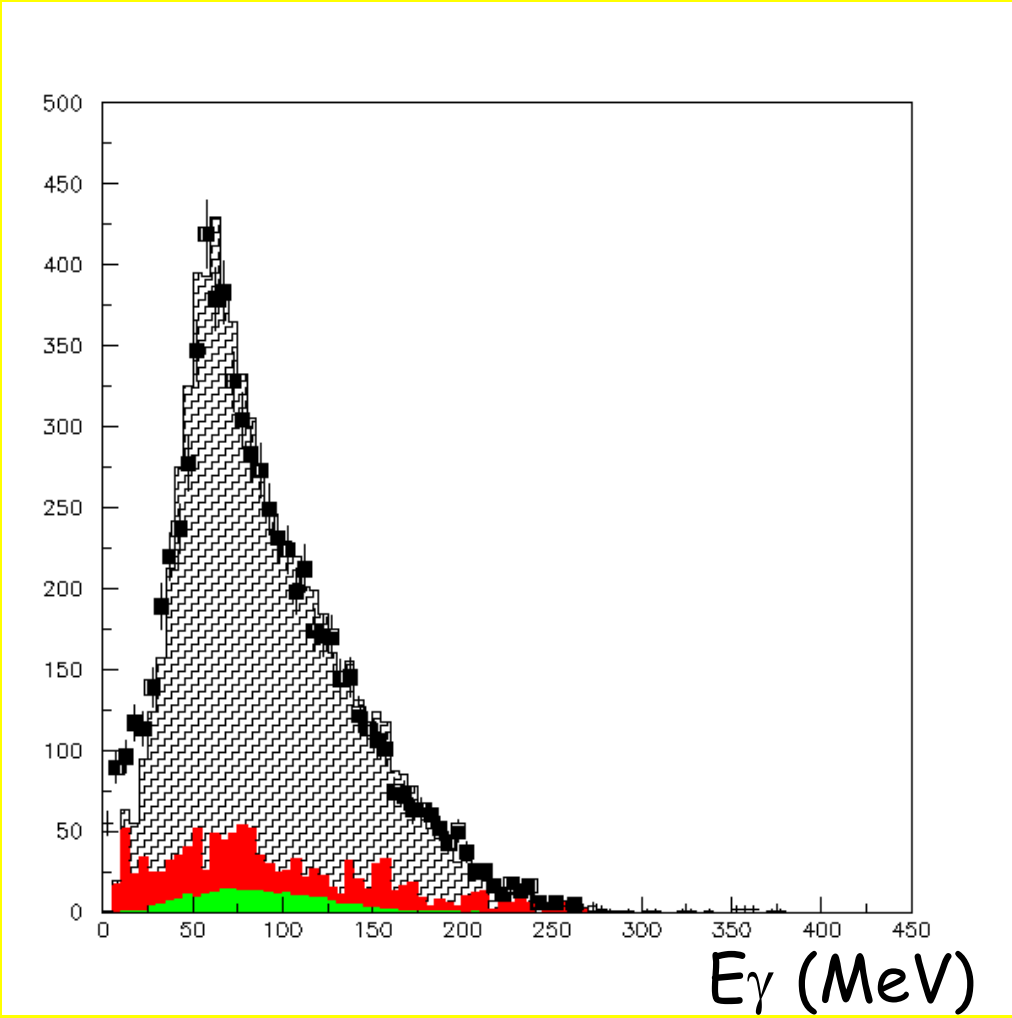
$K_L \rightarrow \pi^+\pi^-\pi^0$

$K_S \rightarrow \pi^+\pi^-\gamma$

$K_L \rightarrow \pi^0\pi^0\pi^0$

- **data**

2001



$K_S \rightarrow \pi^0 \pi^0$

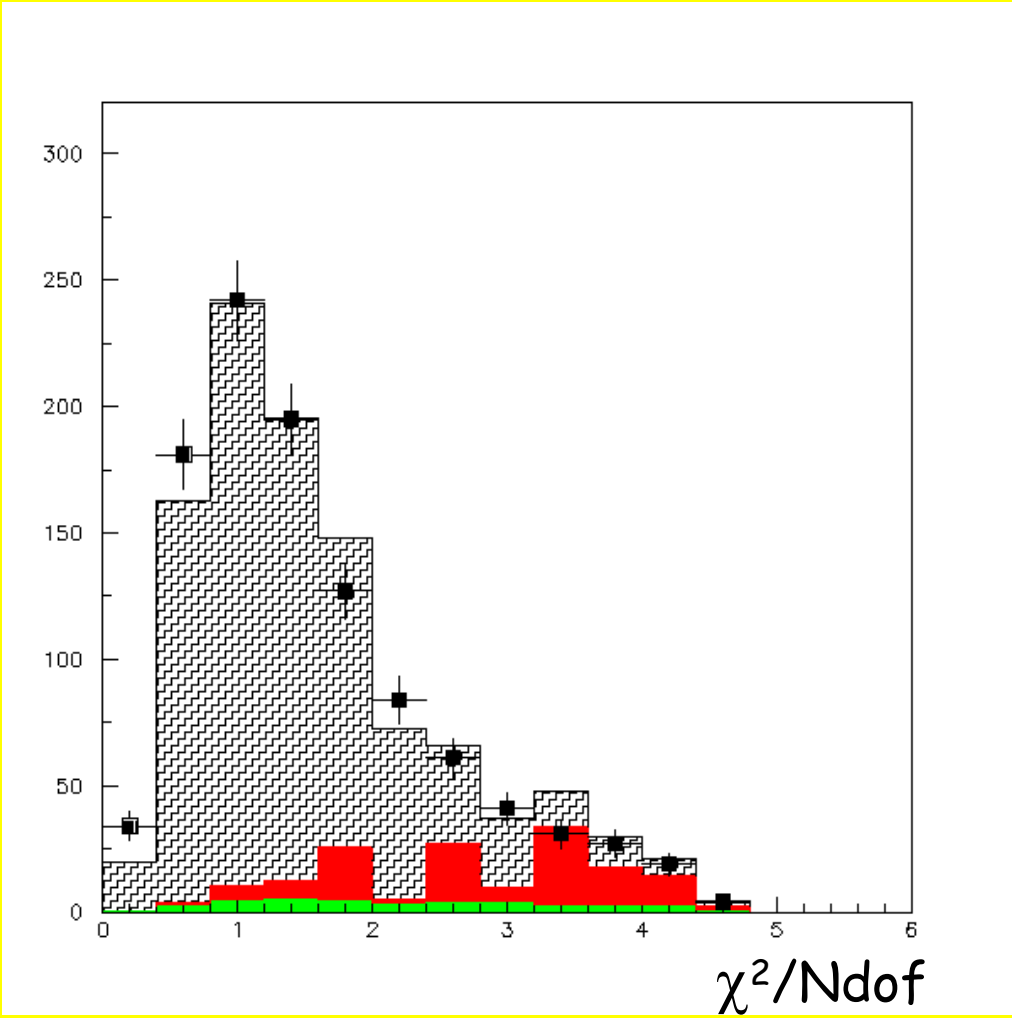
$K_L \rightarrow \pi^+\pi^-\pi^0$

$K_S \rightarrow \pi^+\pi^-\gamma$

$K_L \rightarrow \pi^0\pi^0\pi^0$

- **data**

2001



$K_S \rightarrow \pi^0 \pi^0$

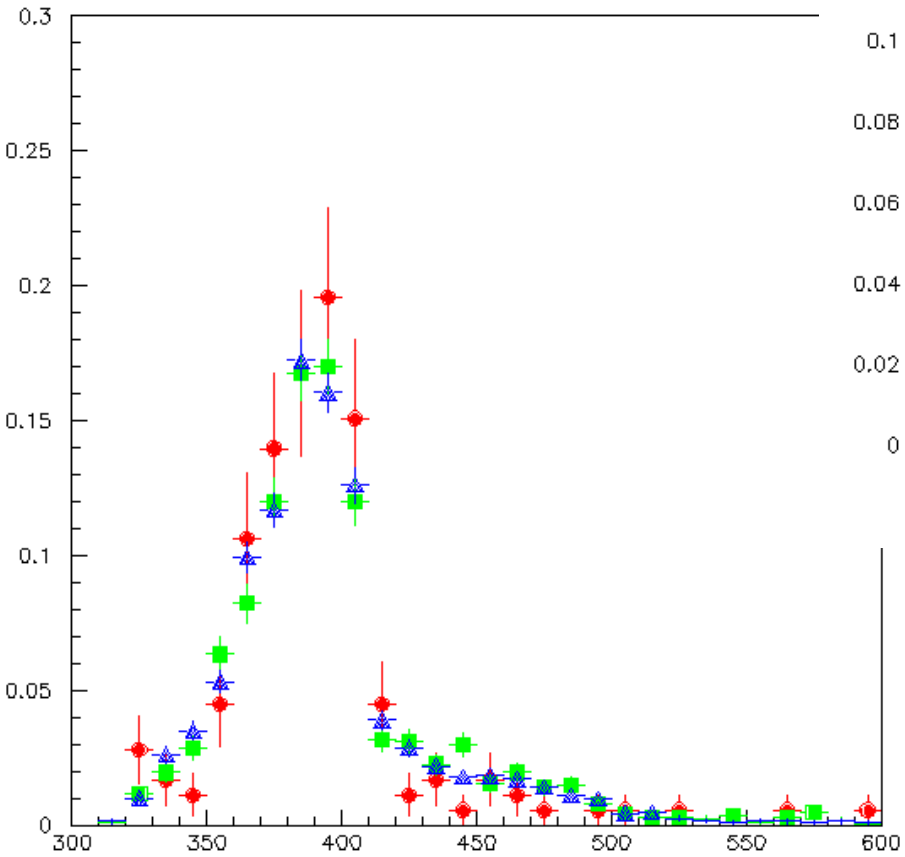
$K_L \rightarrow \pi^+\pi^-\pi^0$

$K_S \rightarrow \pi^+\pi^-\gamma$

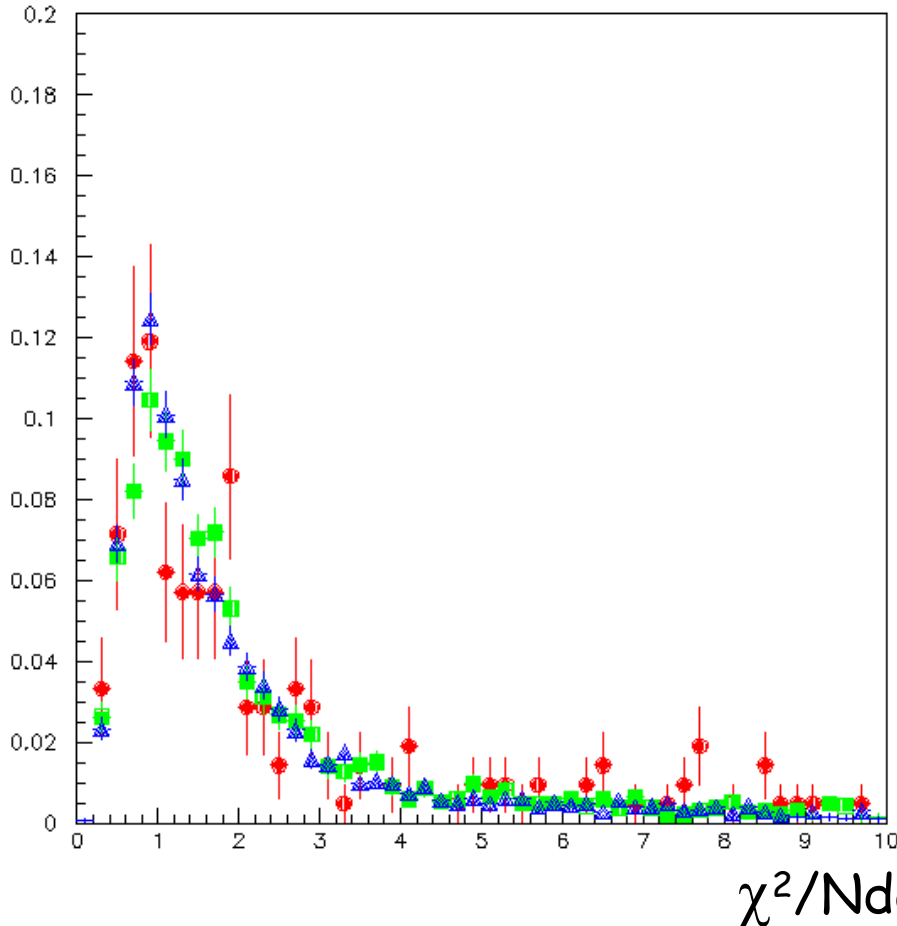
$K_L \rightarrow \pi^0\pi^0\pi^0$

- **data**

2000/2001/2002



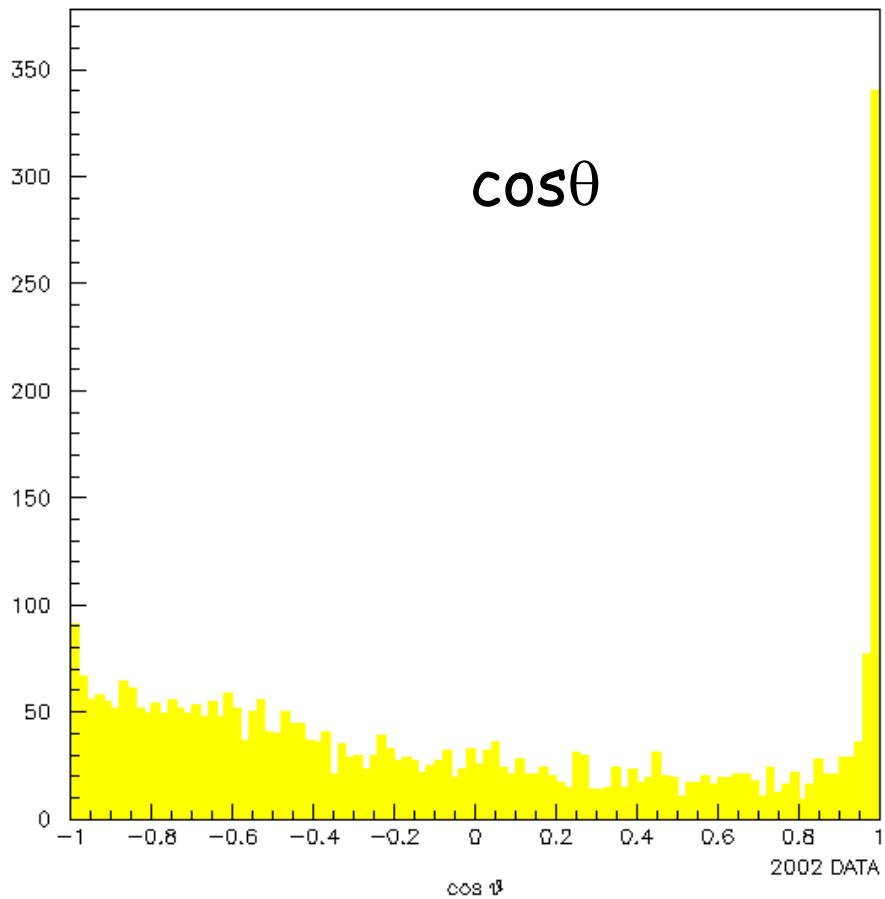
$E\pi^+ + E\pi^-$ (MeV)



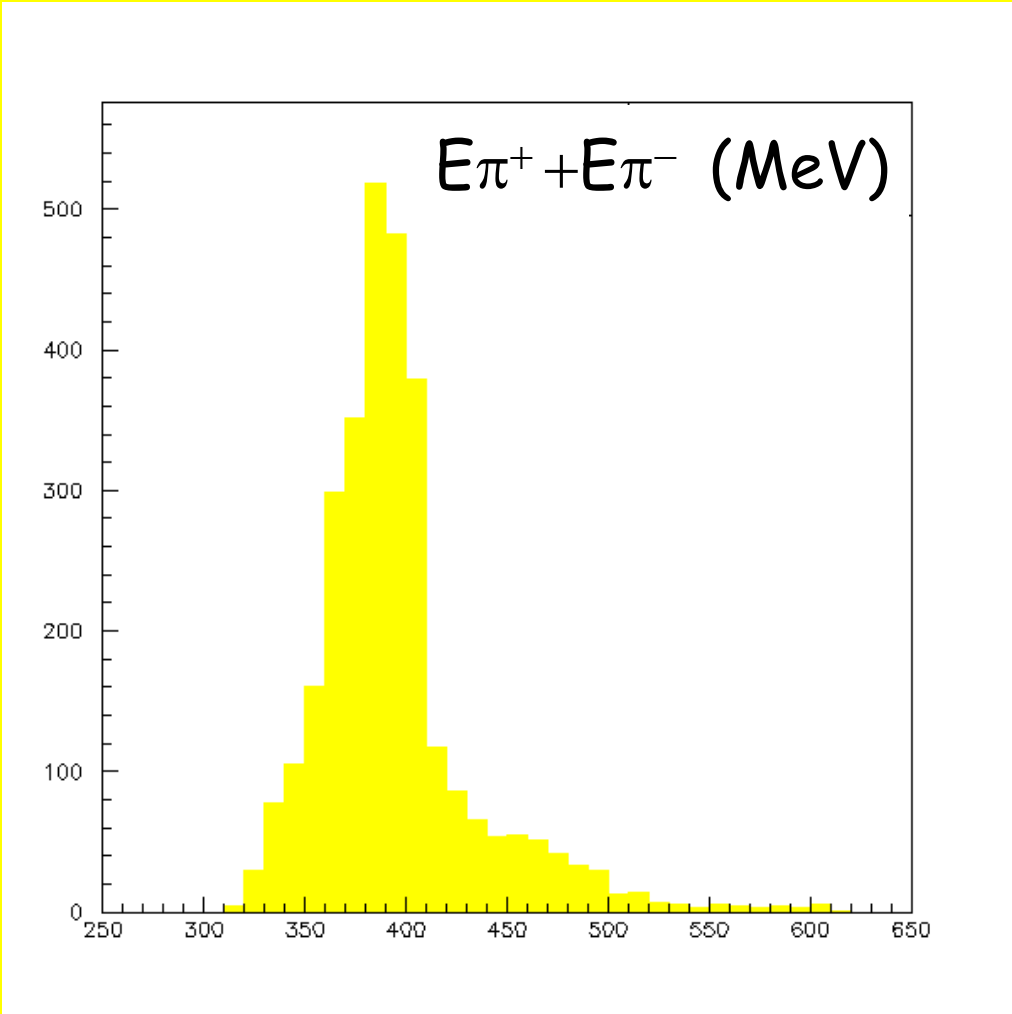
χ^2/Ndof

● 2000
■ 2001
▲ 2002

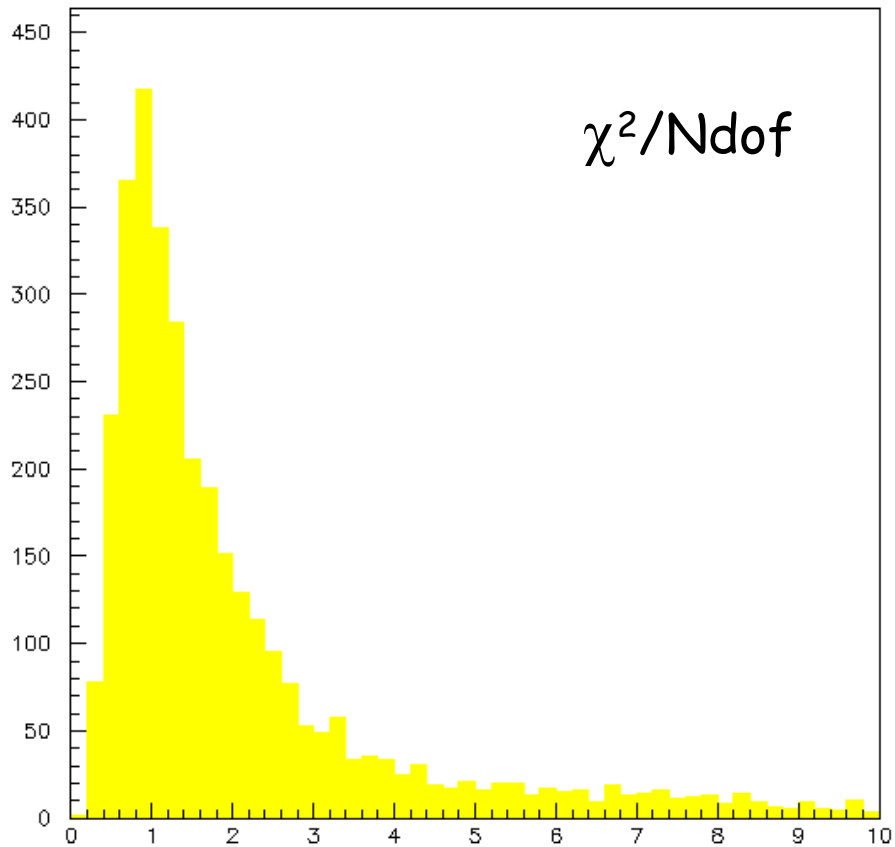
2002


cosθ
350
300
250
200
150
100
50
0
−1
−0.8
−0.6
−0.4
−0.2
0
0.2
0.4
0.6
0.8
1
2002 DATA
cos ϑ

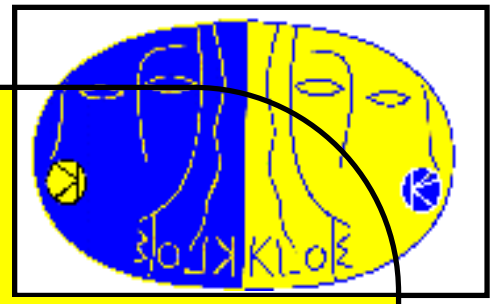
2002


$E\pi^+ + E\pi^-$ (MeV)
500
400
300
200
100
0
250
300
350
400
450
500
550
600
650

2002



Conclusions



- 2000: analysis updated with referees' useful suggestions
- 2001: systematics under study
- 2002: ntuples ready
- 2001/2002: evcl -> discussion