KLOE GENERAL MEETING

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1. Reflections
2. Old measurements
3. Measure better

1.

The LNF SC is quite impressed with KLOE results.
The first consistent measurements of $\pi^+\pi^-/\pi^0\pi^0$.
The first good K_S semileptonic signal.
The very first look at the semileptonic asymmetry in K_S decay.
The spectroscopy results from ϕ-radiative decays.
The K^0-mass and many more to come.

In particular they appreciated seeing preliminary results from 2001-02 data, especially since they promise to confirm and vastly improve the published KLOE results.

So we should take advantage of the no running hiatus for a big step forward in analysis.

KLOE DATA SET

Year	$\mathcal{L}$	ϕ	K^0-tag'd	$K^{\pm}$-tag'd
	μb^{-1}	$\times 10^9$	$\times 10^9$	$\times 10^9$
2001	20	0.06	0.01	0.02
2001	200	0.60	0.10	0.20
2002	300	0.9	0.15	0.30
Tot	520	1.56	0.26	0.50

Maybe optimistic? For really cleaning up many poorly known partial rates, these are staggering numbers.

What is great is that we can chose as we wish. . . not for everything of course.

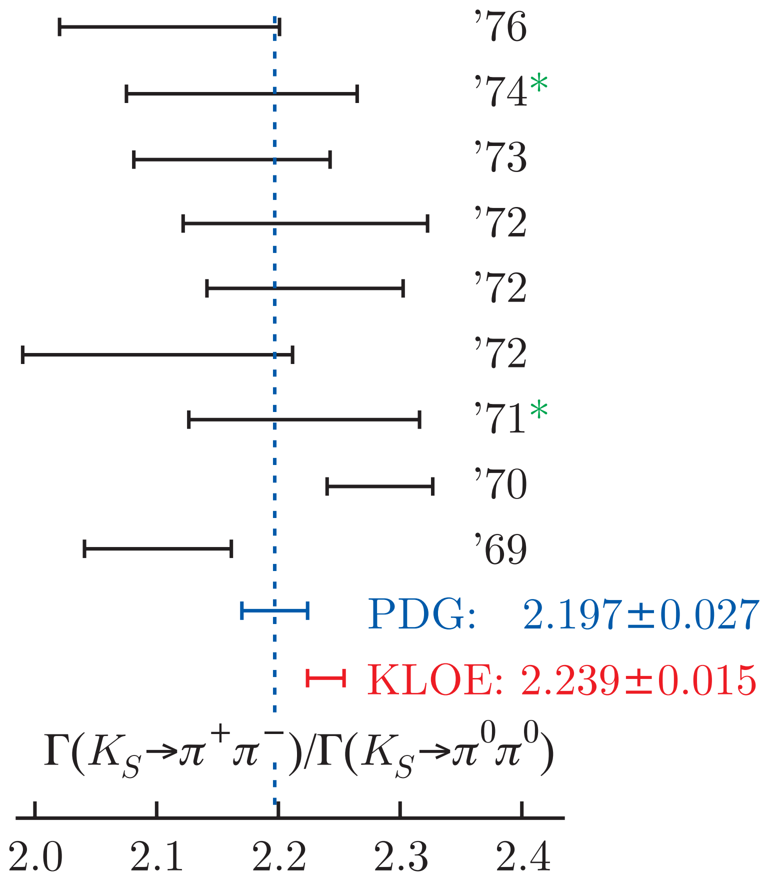
For the future, the committee as a whole strongly endorses the principle of stepping into the fb^{-1}/year era and that might very well happen next year.

"Absolute" measurements, performed or possible are considered of particular importance, and are expected and requested of KLOE, by the world at large.

KLOE remains in the opinion of committee and laboratory management the star program at LNF. We must continue the very promising work that led to our first publications, which have been a surprise after a long silence and are being appreciated by a wide physics community.

2.

An absolutely unique field of excellence for KLOE is the study of $K_{\ell 3}$ and K-2π decays. Both the rare and the abundant ones. In fact at the moment the abundant are almost more interesting. And, let's not forget, if other experiments were to get tired of impossible things – KOPIO, CKM, NA48 -I and -II – they could turn their attention to this and do it too.



$\delta_0 - \delta_2 = 48^\circ \pm 3^\circ$

The example above is typical of what we can do and must continue doing. It also shows the danger of decreasing errors with dubious procedures. The PDG error is not valid!

Lets look at the result from BNL on BR(K^+_{e3}) claiming a 5.3% discrepancy with PDG. See A. Sher, DPF-may2002, also W. Marciano-Heidelberg. The interest here is of course in connection with the problem with unitarity in the first row of the CKM matrix.

$$\text{BNL, E685 } BR(K^+_{e3}) = (5.13 \pm 0.02 \pm 0.08 \pm 0.04)\%$$

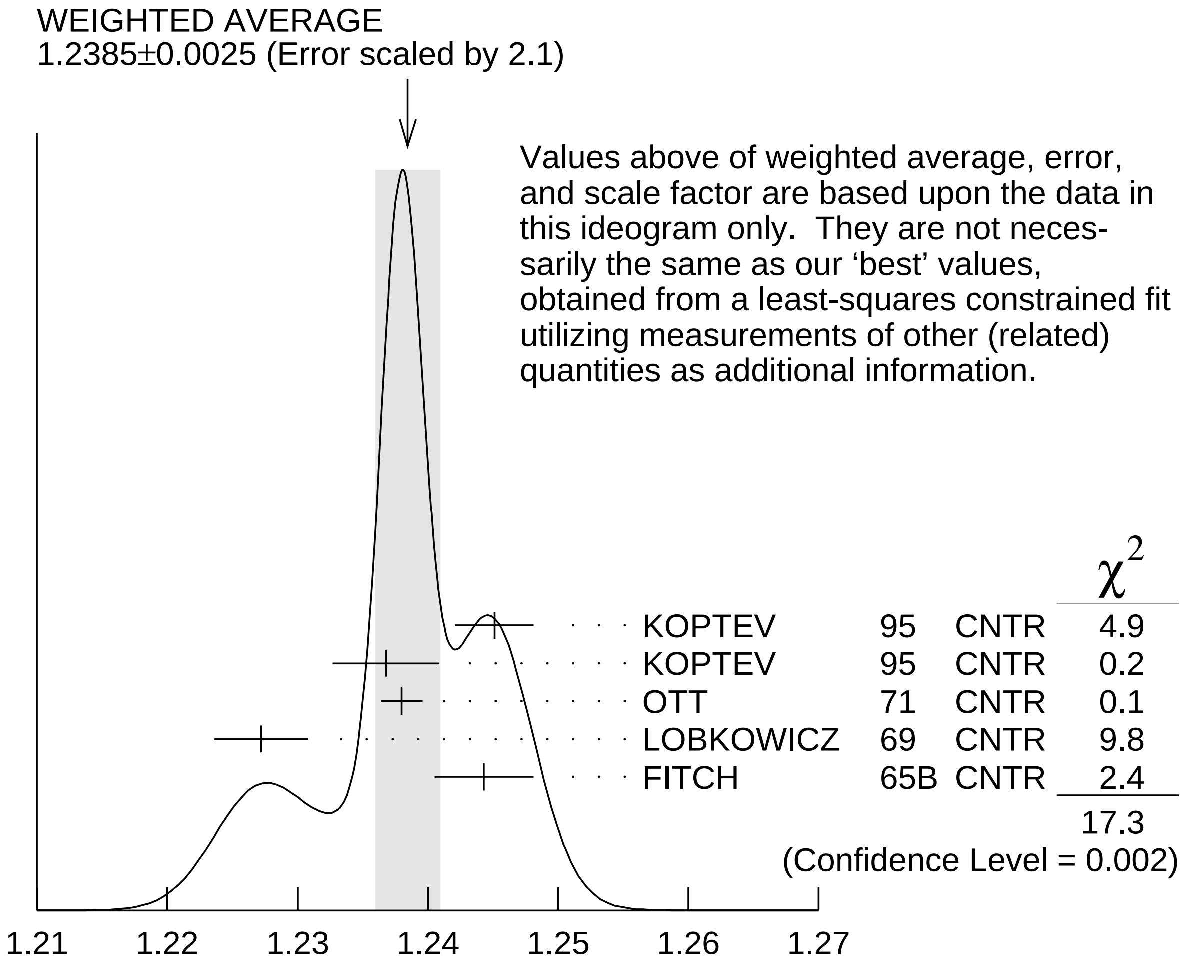
$$\text{PDG 2002, fit } BR(K^+_{e3}) = (4.87 \pm 0.06)\% \quad 1.23\%$$

$$\text{Difference } = (0.26 \pm 0.11)\% \text{ is it real?}$$

on the other hand. . .

$$\text{Meas., '71 } BR(K^+_{e3}) = (4.86 \pm 0.09)\% \quad 1.85\%$$

Other ratios ($e3/\mu2$, $e3/\mu,\pi2$, $e3/\pi2$, ...) have errors of 3.2%, 2.5%, 5.4%, 2.4%.



Finally $\tau(K^{\pm} = 1.2384 \pm 0.0024)$ or 0.2% but $\Rightarrow$

Maybe the error on V_{us} from K^{+}_{e3} should be doubled or worse.

K_L is no better

Item	accuracy	date	ref
$\tau(K_L)$	0.8%	'72	PR D6 1834
$\Gamma(K_{e3})$, fit	1.07%	'02	PDG
$\Gamma(K_{e3})$, meas.	7.2%	'71	LBL, Th
$\Gamma(\pi^+\pi^-\pi^0)$	6.0%	'75	
BR$(3\pi^0)$	1.3%	'95	NA31, indr'ct
$3\pi^0/(e3,\mu3,$+-0$)$	4.23%	'68, '68	

Consequences of BNL

BR(K^+_{e3}) up by ~6% (with Rad. cor.). Then

1. $3\pi^0$ up by 6% KLOE BR($K_L \to \gamma\gamma$) is wrong

or

2. $3\pi^0$ down by 7.5% KLOE BR($K_L \to \gamma\gamma$) is wrong

or

3. BNL result is wrong...

But $V_{ud}^2 + V_{us}^2 = 1 - (3.1 \pm 1.3) \times 10^{-3}$
From $\delta \sum |V_{ui}|^2 \sim 2\delta V_{ud}/V_{ud} + 0.1\delta V_{us}/V_{us}$ and BNL:
$V_{ud}^2 + V_{us}^2 = 1 + (3.1 \pm 1.3) \times 10^{-3}$

So what do we conclude, is Sher better or worse? Of course BNL could improve their analysis... and convince(?) everybody.
Errors must be reduced.

KLOE program 2003

The time has come to measure all $BR(i) \equiv \Gamma(i)/\Gamma$, including properly radiation, and also $\tau(K_L)$, $\tau(K^{\pm})$, the last possibly the hardest. The same applies to ϕ-decays.

We are unique, because of the tag. We KNOW there was a kaon before we searched for its decay.
We have very similar samples of charged and neutral kaons.
We must make sure we understand the tag biases.

Physicists everywhere are interested in these quantities.

Merry Christmass

and

Happy New Year