# *Referee considerations on $\sigma(e^+e^- \to hadrons)$*

S. Miscetti and M. Moulson
$\phi$-decay WG meeting, 3 October 2002

- **Status of refereeing**
- **Publication goals**
- **Status of analysis**
- **Possible scheme for paper**

# *Status of refereeing*

- **No draft yet exists**

- Referees have met with $\pi\pi\gamma$ group

  - 2 official meetings

  - Numerous other unofficial conversations

- Referees getting up to speed on theory and analysis

  - Most discussion so far about conceptual issues

  - Referees have also been discussing analysis points, but have not yet discussed these at length with $\pi\pi\gamma$ group members

# *Publication goals*
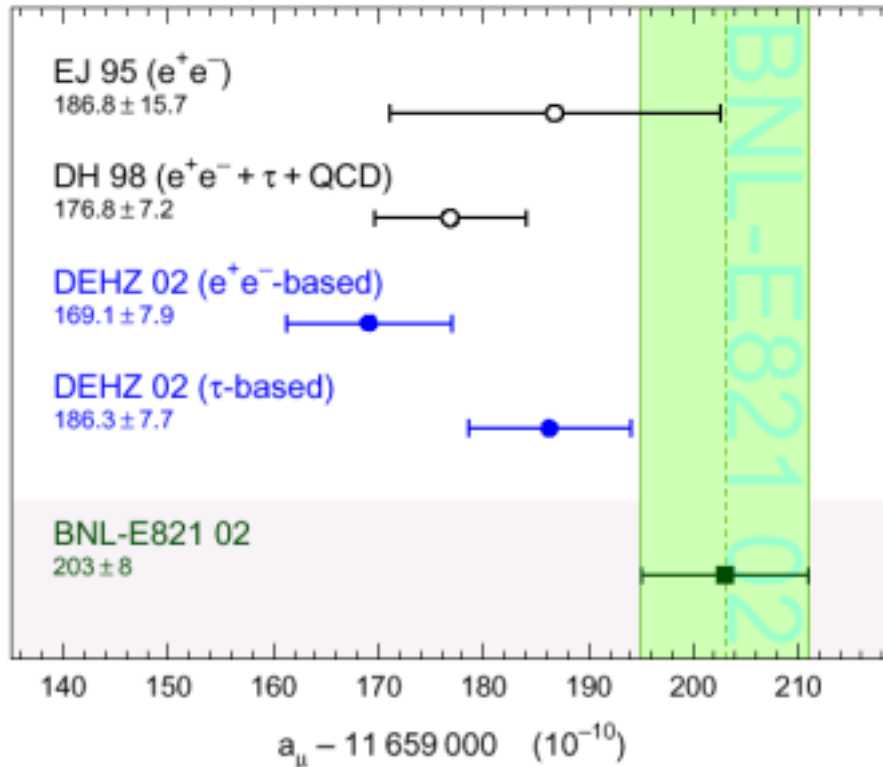


**Aug '02 result from E821**
  60% of final statistics

**Aug '02 results from Davier *et al.***
  $e^+e^-$ analysis
    Latest CMD-2 "result"
    (Old data, mainly new treatment
    of radiative corrections)
  $\tau$ analysis

Agreement not wonderful between
  • Experiment and phenomenology
  • $e^+e^-$ and $\tau$ results

**Phenomenological situation begs to be clarified → KLOE contribution**
    **• Confirm CMD-2 results on $e^+e^-$ → hadrons**
    **• See how chips fall vis à vis $e^+e^-$ vs. $\tau$ calculations**
**Much interest, short publication time scale important**

# *Realistic analysis goals*

## __Small $\theta_\gamma$__

High statistics

FSR treatment not problematic
  Long development times for
  correct treatment of FSR in
  generators

$f_0$ interference not problematic

$\pi^+\pi^-\pi^0$ background reduced
  NB: For large $\theta_\gamma$, can detect $\gamma$
  to reduce background

## __Large $\theta_\gamma$__

Coverage for low $M_{\pi\pi}^2$
  Interesting region for $a_\mu$ which
  CMD-2 data do not cover

*Referees and $\pi\pi\gamma$ group
members agree that it is best
to focus on small $\theta_\gamma$ analysis
for purposes of a first paper*

*Aside: We want KLOE to establish priority on radiative return method!*

# *Status of analysis*

Various analysis items being studied, much work in progress:

| | |
|---|---|
| **Trigger/veto efficiency** | M. Incagli |
| **Track/vertex efficiency** | M. Incagli |
| **FILFO efficiency** | S. Muller, S. DiFalco |
| **Likelihood** | B. Valeriani |
| **Track mass resolution** | B. Valeriani, F. Nguyen |
| **Background studies** | B. Valeriani, A. Denig |
| **Generators** | A. Denig |
| **Luminosity systematics** | A. Denig |
| **Fit to $|F_\pi|^2$** | G. Venanzoni, F. Nguyen |

# *Progress towards a draft*

**Referees just getting started on comprehensive review of experimental aspects**

Before writing a draft, $\pi\pi\gamma$ group plan is to produce:

- a memo detailing each analysis item
- a general memo describing entire analysis

Clearly *several months of work related to documentation*

Referees' observation:

*Status of individual analysis items is good, but efforts towards producing a paper lack focus*

Referees strongly recommend a shift in emphasis:

- *Write draft of small-angle paper as soon as possible*
- Scrap individual memos
- Create any necessary supporting documentation on the fly

# *Ingredients for paper*

KLOE observable most interesting to phenomenological community is $d\sigma(e^+e^- \to \pi\pi\gamma)/dM_{\pi\pi}^2$

- Centerpiece of paper, with data in tabular form
- Phenomenologists can obtain $d\sigma(e^+e^- \to \pi\pi\gamma)/dM_{\pi\pi}^2$ and $\delta a_\mu$ by their own means
- Requires deconvolution of experimental response

Fit to $|F_\pi|^2$ and/or derivation of $d\sigma(e^+e^- \to \pi\pi\gamma)/dM_{\pi\pi}^2$ of secondary importance

- Will appear in paper as discussion
- Useful in analysis for tuning MC and extracting response function

# *Conclusions*

**Referees are meeting with group members and getting up to speed**

**Need short timescale for publication**

    Intrinsic interest in measurement

    KLOE commitments (milestones, etc.)

**Propose January timescale for draft of a paper**

    Small angle paper best bet on this timescale

    Highest priority for group is to put this draft together

**Referees getting started on comprehensive review of experimental aspects**