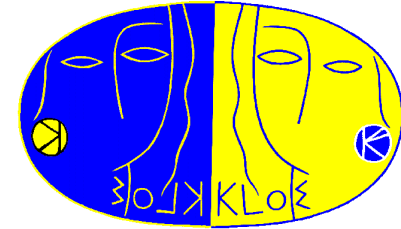


# *Realistic MC production*



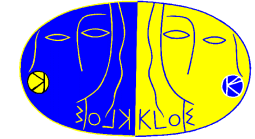
M. Moulson, 24 September 2002

## **Working meeting**

### ***Outline:***

- *2001 data – BVLAB scan*
- *ACCELE/MBCKADD  
selectors*
- *Logistical issues for MC  
production*





## *BVLAB scan of 2001 data*

---

All 2001 Bhabha files scanned with BVLAB module

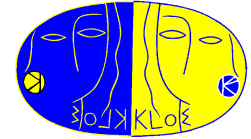
For each run (file):

- number of hits in  $\gamma\gamma$  events
- number of (un)associated hits in VLAB events
- quantities related to LAB/VLAB topology
- $\sqrt{s}$  distribution for VLAB events

New  $\sqrt{s}$  scan!

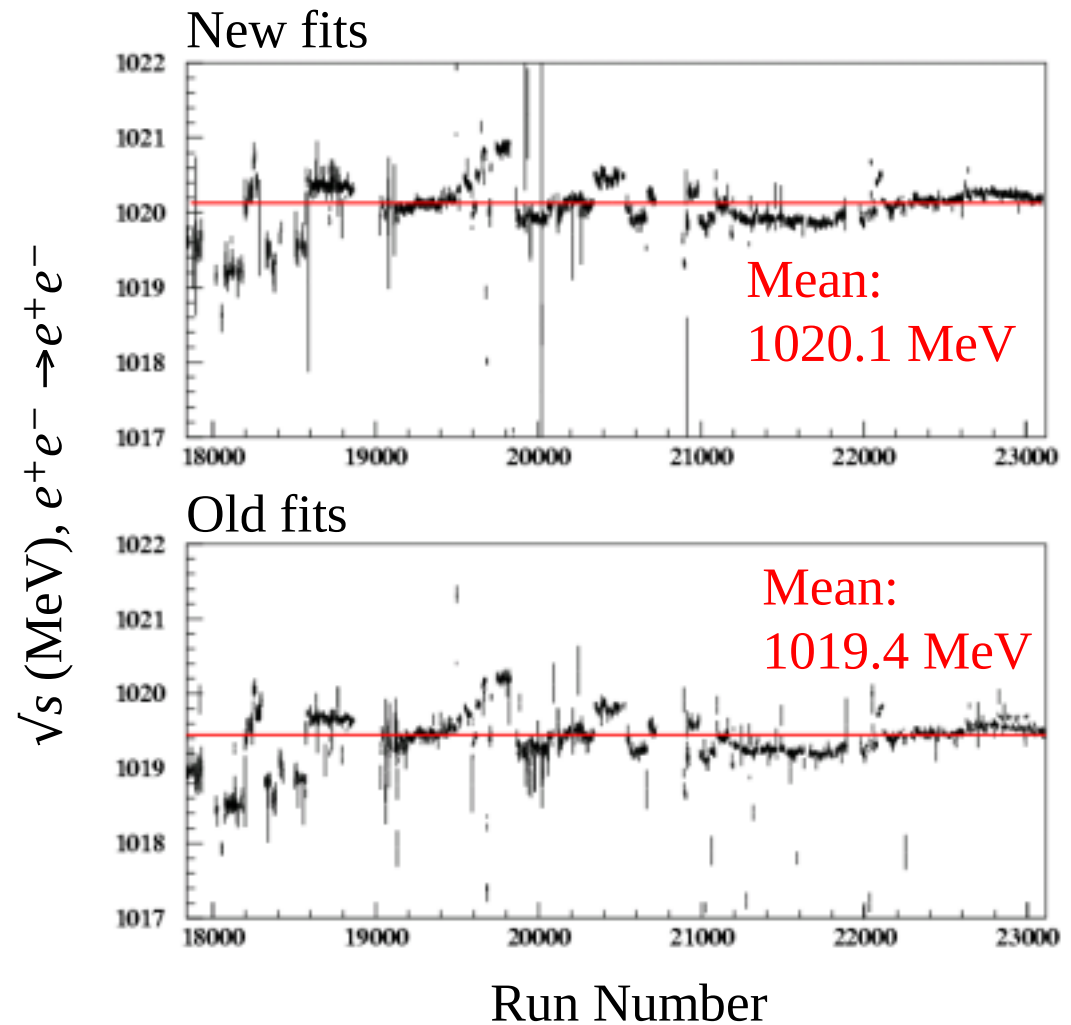
---

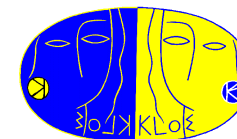
# New fits for $\sqrt{s}$



- Antonelli/Dreucci fit
- New reference distribution  
State of the art  
MC/reconstruction
- 300,000 VLAB events  
10x improvement in statistics
- Uncalibrated  $\sqrt{s}$  values shift  
+0.68 MeV!

2001 data





# VLAB momentum reconstruction

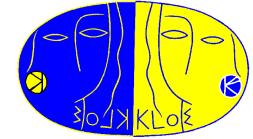
---

|                                              | Old          | New          |
|----------------------------------------------|--------------|--------------|
| Generated $\sqrt{s}$                         | 1019.92      | 1019.4       |
| Est. energy loss, $e^\pm$ naïve B-B          | $-1.6(?)$    |              |
| Est. effect of rad. tail                     | $-0.2(??)$   |              |
| Pion energy loss compensation                | $+1.0$       |              |
| Expected peak after recon.                   | 1019.1       | 1018.6       |
| Peak $\sqrt{s}$ after recon.                 | 1020.3       | 1019.1       |
| Peak $\sqrt{s}$ found – expected, MC         | <b>+1.2</b>  | <b>+0.5</b>  |
| $m_\phi(\text{scan}) - m_\phi(\text{CMD-2})$ | <b>-0.15</b> | <b>+0.55</b> |

Momentum scale discrepancy in MC/data worse than previously thought?

New fit more consistent:

- New fit: VLAB,  $\theta > 55^\circ$ , both signal and reference histograms
  - Old fit: HMAKE,  $\theta > 23^\circ$  but reference histogram  $\theta > 51^\circ$
-



# *Background tools*

---

Tools for inserting background:

- **ACCELE**: EmC clusters
- **MBCKADD**: DC hits

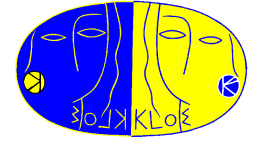
Both feature selection and insertion phases (modules)

## **MBCKADD**

- Selects  $\gamma\gamma$ , Bhabha,  $\eta\gamma \rightarrow 3\gamma$  events
- Removes correlated hits
- Can run on L3BHA stream
- Output file size: 200 bytes/evt
- 1 M evts needed for analysis (200 MB)
- Multiple insertions possible

Review of **ACCELE** module and selection criteria?

---

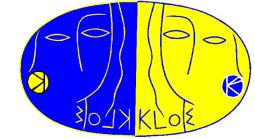


# *Conclusions from last meeting*

---

## Objectives:

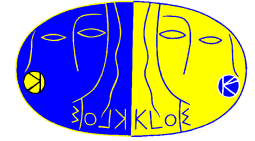
- Unified output file format: compressed YBOS
  - Unify event selectors for logistical simplicity  
At least in same executable
  - Single output file
  - Insert background for both EmC and DC simultaneously
  - Complete simulation of background in physical event  
Interplay of hit-blocking, t0 corruption, etc.
-



## *Event-selection issues*

---

- How compatible are selection criteria with those of MBCKADD?
  - Can MBCKADD and ACCELE selection modules be combined?
  - Can we write a single output file?
  - How do we deal with events selected by one module and not the other?
  - Can MBCKADD and ACCELE insertion modules be combined?
-



# Quality-control issues

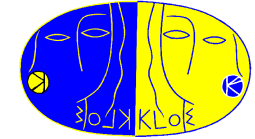
---

Is detector geometry same for MC/data reconstruction?

If no: do we reconstruct with MC or data geometry?

Quality control:

- Does background scan of merged events yield same results as original background scan?
  - Is track quality ( $\chi^2$ , mean number of hits) same as in data?
-



# *Database and production issues*

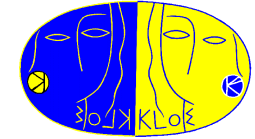
---

## Sampling techniques:

- Global:
  - Inserted events from all runs
  - Make sure all used roughly same number of times
  - Mirrors data exactly if standard data set defined
- Local:
  - Inserted events from run group with given background conditions
  - Final sample obtained by combining run groups on basis of  $L$
  - Less exact, but a little more flexible if standard run groups defined

## Database issues:

- Modifications to database to track source of inserted events
  - New fields in appropriate table to contain background parameters for data
-



# *Logistical considerations*

---

## Generation/reconstruction policy:

- Always do first reconstruction with no background
- Successive reconstructions can be made on reconstructed file without background by dropping appropriate banks
- Implies keeping first reconstruction on tape

Once background has been introduced, re-introduction of new background level impossible

## Do we have sufficient offline resources?

## Other logistical issues?

---