

MINUTES of the ALEPH TRIGGER MEETING

(Held at CERN on sept. 16, 1987)

Present:

Barcelona:

Bari:

Beijing:

CERN:

Clermont: M. Brossard, D. Pallin

Copenhagen: R. Mollerud

Demokritos:

Ecole Polytech.:

Edinburgh:

Frascati:

Glasgow: K. Smith

Heidelberg: O. Braun, P. Hanke, E. E. Kluge, M. Panter, K. Tittel

Imp. College: M. Cattaneo, P. J. Dornan

Innsbruck:

Lancaster:

Marseille:

MPI München: M. Bosman, G. Lütjens

Orsay: J. F. Grivaz

Pisa: C. Bradaschia, J. Steinberger

Rutherford: G. McPherson, D. P. Salmon, J. Thompson,

R. H-way Coll.: P. March, M. Saich, J. Strong

Saclay: A. Joudon, S. Loucatos, A. Roussarie

Sheffield:

Siegen: C. Grupen

Trieste: L. Rolandi

Wisconsin: J. Conway, J. Hilgart

12:09:45 08.09.87
Paul HANKE

ALEPH TRIGGR MEETING

Next TRIGGR meeting on << 16.09.87 at 09.30 >>
Place : CERN
Conference room: Bat. 32/1-A24
Distribution : NO

AGENDA

- 1 - Hadron Calorimeter
 - a) Barrel wires (12 vs. 24 modules), Cosmic T-zero, signal properties, cabling
 - b) Pad signal: signal properties, any changes? cabling
 - c) Test scintillators
- 2 - El.-mag. Calorimeter
 - a) Barrel pads: electronic transmission chain, cabling
 - b) Endcap pads: cabling, cable lengths
 - c) ECAL wires: cabling, signal properties
- 3 - Trigger and on-line software (M. Panter)

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Discussion on trigger from track chambers (sometime during ALEPH Week)

- a) cabling
- b) test of signal transmission to trigger

1. In response to the memo from the trigger group on cables and connectors the HCAL group was ready to answer the still open questions. The discussion on technical details was shifted to a meeting amongst experts in the afternoon.

Some years ago the T_0 for triggering on cosmics was foreseen to be derived from scintillators placed below the detector instead of the staged muon layer two. Now, it's clear that these muon chambers will be in place right at the start of the experiment. Therefore the idea of using the scintillators was unanimously discarded. Instead the T_0 will be derived from the wire signals of the HCAL. The exact arrival time, the jitter and the background of this signal has to be clarified. The trigger group will do that and send a memo on their results as a proposal to all detector groups. The groups interested in a cosmic trigger are then asked to react.

2. The groups building the ECAL were not yet ready to give their response to the memo on cabling, but they will have a meeting in Paris on 30.9. - 2.10. , where they will finalize their specifications on cables and connectors. They would appreciate if somebody from the trigger group could attend their meeting.

3. The talk on trigger and online software was shifted to the online meeting.

4. K. Tittel put the attention of the collaboration on a somewhat forgotten problem in running ALEPH, namely a beam quality monitor. Copies of his transparencies are attached to these minutes. He described how the beams can be monitored with the currently foreseen means during data acquisition. Another possibility would be a special run in a multidetector partition, which contains the detectors close to the beam and the trigger. Independent of that, the rates from the VSAT and the currents drawn by the ITC and the LCAL are related to the beam quality.

It was realized, that a person is needed, who evaluates, whether these informations are sufficient or whether extra hardware is required and to coordinate the work on beam quality monitoring. This person will be appointed at the steering comitee.

5. J.-F. Grivaz presented his idea on rejecting background events in the ECAL by measuring the energy in the trigger segments at two different times, discarding events with an unphysical signal ratio on trigger level three. His transparencies are attached to these minutes. The discussion on the implication of this proposal was shifted to a small meeting between the speaker and some of the trigger group.

Next Meeting: WED., 25th November 1987
at 9.30 h
in CERN
place: bat. 32, 1 - A 24

Beam Quality Monitor

V. TITAC, Sept. 87

Need Thermometer to tell Quality of beam.

Good Quality means: low background, so that:

- detectors (in particular ITC, IPC) do not suffer,
- data taking is possible and events are clean.

⇒ use devices which are most sensitive to beam associated background:

1. Small angle luminosity counter (SALC)
2. Luminosity calorimeter (LUMCAL)
3. ITC
4. Luminosity tracking devices.

122: sensitive to energy deposition (\sim GeV)

324: sensitive to low energy ionisation due to synchrotron radiation or e.m. showers

Aim: Continuous display of all relevant variables

Available information:

SALC: Single rates of all counters

LUMCAL: Rates of hits above a given threshold ($\sim 6\text{GeV}$) for each segment (12 per inner and 12 per outer ring) \Rightarrow 48 segments.

ITC: Rates, how often each of the 8 planes had more than a given number of hits.

Rates, how often 1, 2, ... tracks were found.
(Beware; Multiple counting)

LUM-Tracker: ?

Data retrieval: Through standard DAQ-System to main-VAX \Rightarrow Data can be manipulated, only relevant data will be displayed (experience has to tell us)

\Rightarrow During normal RUN-condition: All information contained in the event-block.

\Rightarrow During HALT- or PAUSE condition: no data to computer \Rightarrow Special RUN condition has to be set up. Details not worked out; is it even possible?? Possibly a special logic has to be constructed to generate all necessary ~~data~~ pulses (e.g. GBX, EGBX, timing pulses for trigger, etc.) only for the devices in question.

Off-time sampling of Calorimeter Trigger Sums.

(See Aleph Note 87-32)

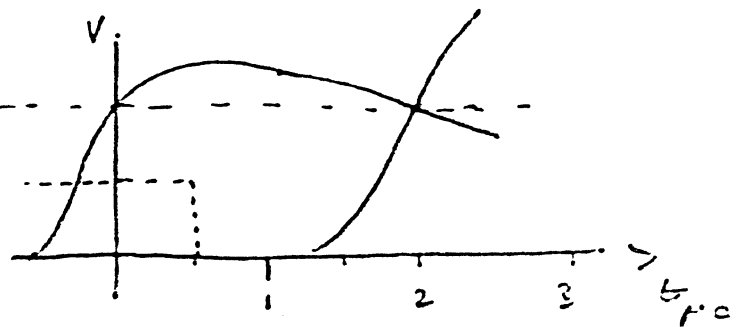
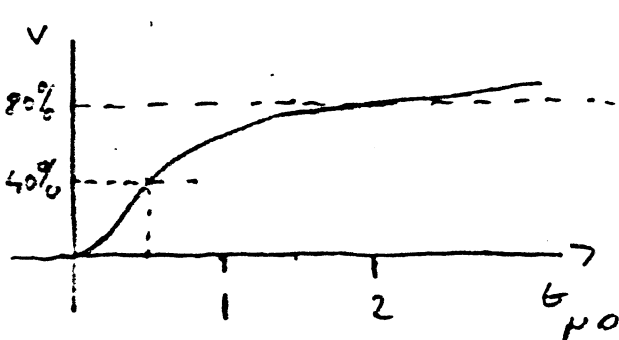
Motivation:

Level	Rates (Hz)	
	Charged Triggers	Calorimeter Triggers
1	500	⑤?
2	10	
3	1	1

⑤ → ① still to be demonstrated

↑
∴ only adjustable by energy threshold tuning.

Principle: used in CELLO at PETRA } L.A.
to be " " MARK II + SLC } coll.



CELLO → $\sigma_t \sim 30 \text{ ns}$!

Efficient to reject:

- cosines: not a problem.

at the trigger level. May help in off-line analysis of rare events.

- coherent noise: you

will know its level only once you have started...

Note: $\frac{\text{Signal/Noise} | \text{wire calor}}{\text{" | L.A. calor}} > 1$, but not $\gg 1$.

Implementation:

Record trigger sums twice instead of once
=> simply double # ADC's.

To do in level 3 processor:

* Pedestal monitoring (Random Triggers)
" subtraction.

Minor problem: automatic base line restoration
done by hardware for in-time sums,
not for off-time sums.

* Calibration monitoring (Bhabhas)

* Comparison of in-time and off-time signals
Tolerances ($\sim 3\sigma$) to be determined
as a function of energy (e.g. final states)

=> Very simple / fast

(Could easily develop into a level 2 if needed)
