JADE Computer Note 47

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28.11.1980

New Pattern Recognition Programs

The pattern recognition program PATREC has been improved by adding a program step which runs as a preprocessor before the PATREC-program. In the preprocessor step only those tracks are recognised which:

a) pass at least through ring 1 and half of ring 2,
b) have a transverse momentum of at least ~200 MeV,
c) originate within ~15 mm of the beam axis in the x-y projection.

In order to be registered the track found must fulfil the following condiditons:

1. σ(fit) < 0.32 mm,
2. no gaps of more than 4 hits in the region where no other tracks overlap,
3. tracks stopping before layer 42 (middel of ring 3) must leave the detector in the z-direction.

95% of the tracks which fulfil conditions a, b, c are accepted.

After the preprocessor step the standard PATREC is called using only the yet unassociated hits.

Calling sequence: CALL PATRCO(IND)

IND = 0: only the prprocessor step is executed
= 1: preprocessor step + subsequent PATREC using only unassociated hits are executed
= 2: only the old PATREC is performed

Results:

PATREO is ~30% faster on multihadronic events; on REDUC1-events the program is ~10% slower than the old slow version of PATREC.

The track finding efficiency is only slightly improved.

The systematic errors of momentum and direction at the origin are very much improved (P. Warming).

Track array in PATR-bank:

Tracks found in the preprocessor step are labelled by a 16 in word 2 of the track array (program identifier).
Tracks assumed to come from the origin in the x-projection are labelled by a 1 in word 4 of the track array (type of 1st point of the track).
Tracks assumed to come from a pair conversion in the beampipe or the pressure tank are labelled by a 2 in word 4 of the track array (type of 1st point of the track). However the fit parameters in the track array are obtained without constraining the track to pass through the origin, or to come from a pair conversion.