Preparation for Beam Functions (III)

April 4, 2003

Delay coincidence (DELC)

– Function

To reject 1-beam backgrounds

– Definition

Decay time should be $[2.0, 5.0]ns$ later than beam time according to following 8 conditions:

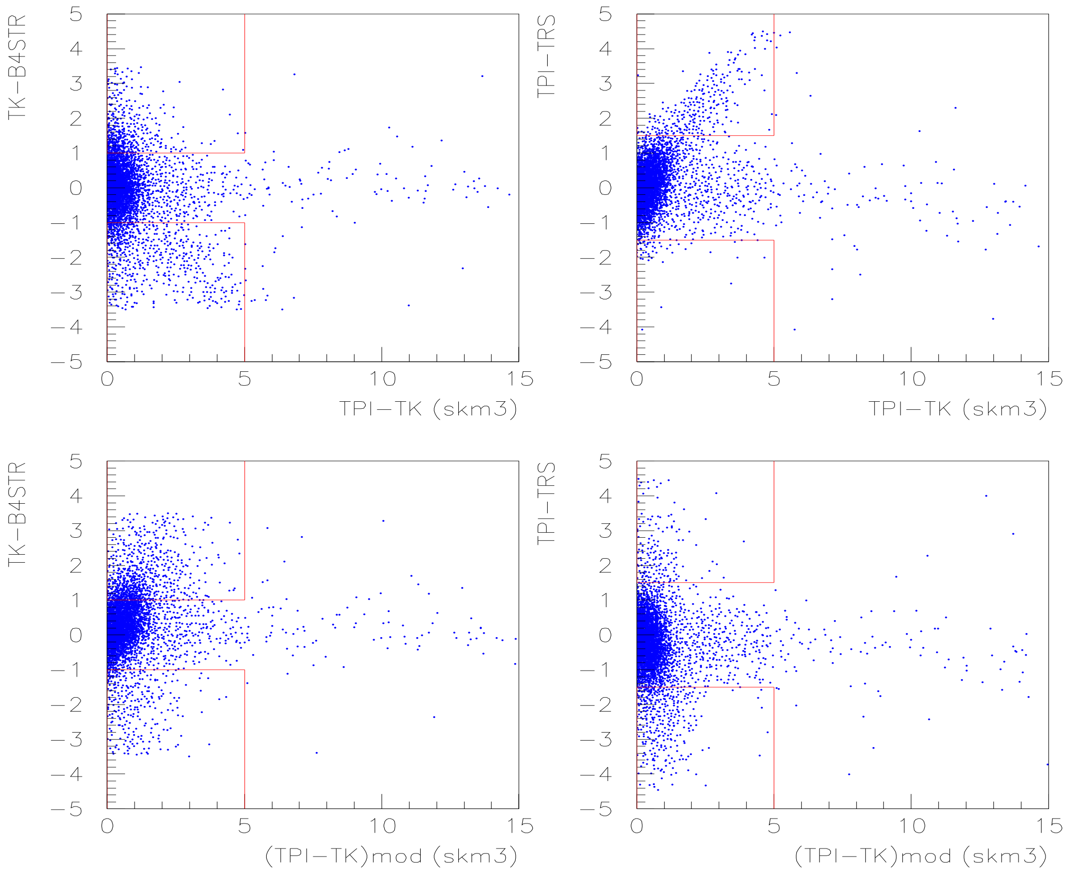
1. not good beam timing consistency $\surd$
2. not good track timing consistency $\surd$
3. IC time used for tpi
4. $E_K <$ 50MeV
5. $npi\_tg \leq 3$
6. beam likelihood value less than 200
7. not good Kaon fiber timing consistency
8. not good Pion fiber timing consistency

– Acceptance

83.50% (98: 88.10%)

Categories I & II

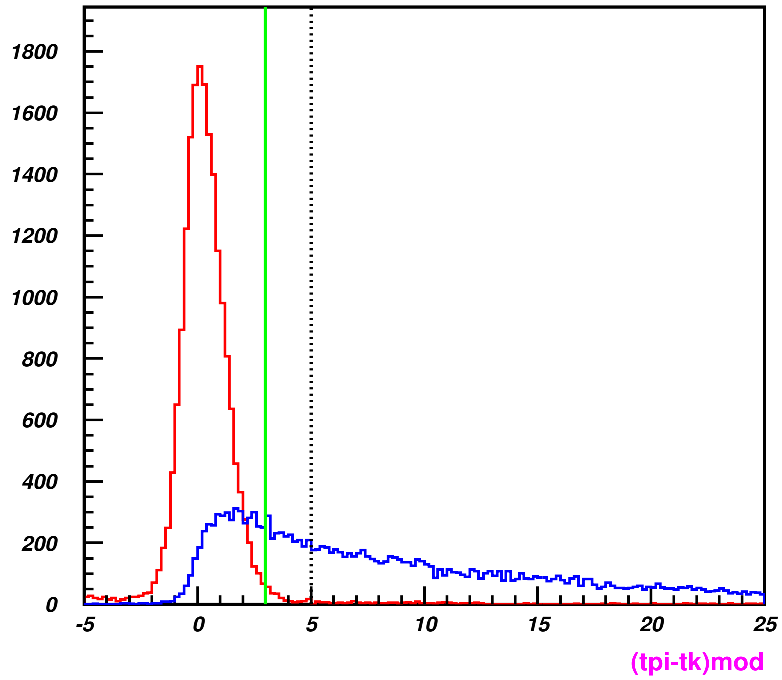
- use $b4str$ instead of tk when tk measurement is not good
- use tk and $b4str$ average time instead of tk when tk measurement is good
- use trs instead of tpi when tpi measurement is not good
- use tpi and trs average time instead of tpi when tpi measurement is good



Comparison of DELC cuts (categories I & II)

Category III

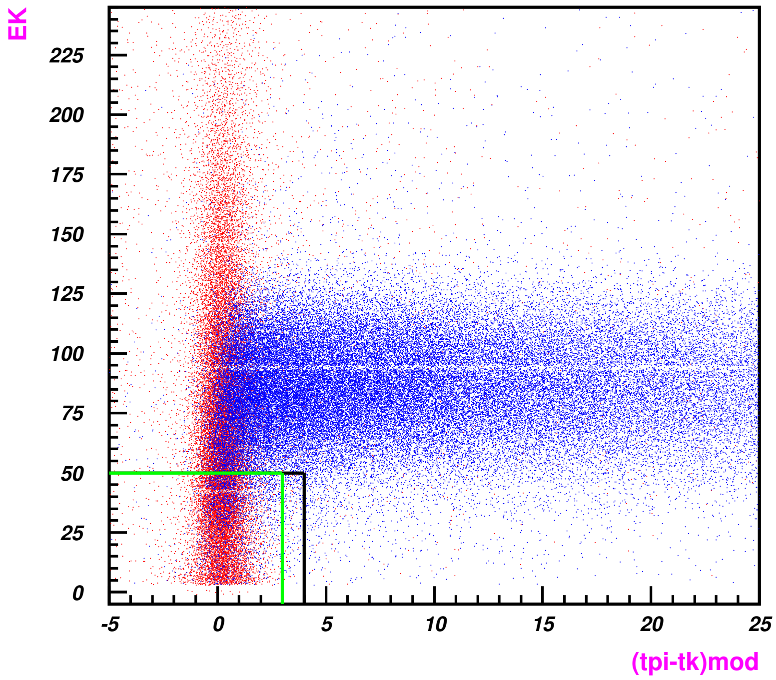
- when tpi measurement is not good the delay coincident cut position is changed (from $5ns$ to $3ns$)



Cut position adjusted for category III

Category IV

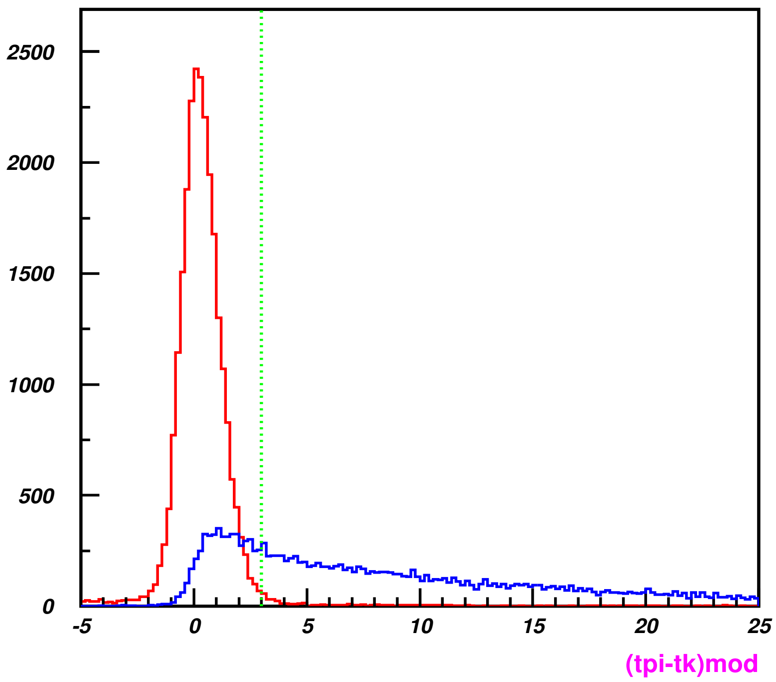
- when ek is less than 50 MeV the delay coincident cut position is changed (from 4.0ns to 3.0ns)



Cut position adjusted for category IV

Category V

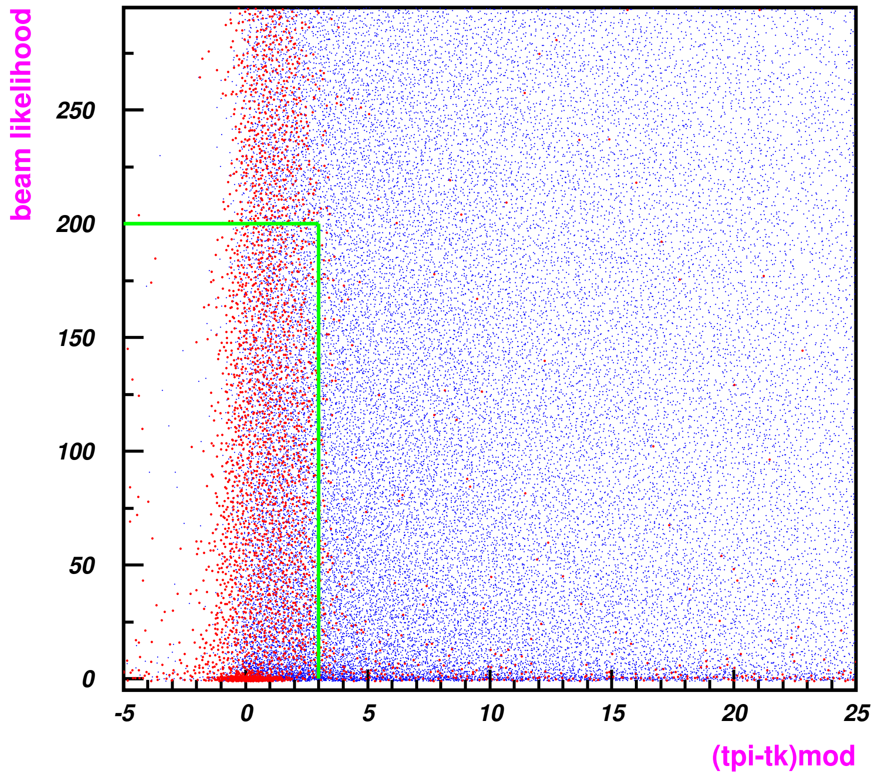
- when npi_tg is less than 4 the delay coincident cut position is kept unchanged.



Cut position checked for category V

Category VI

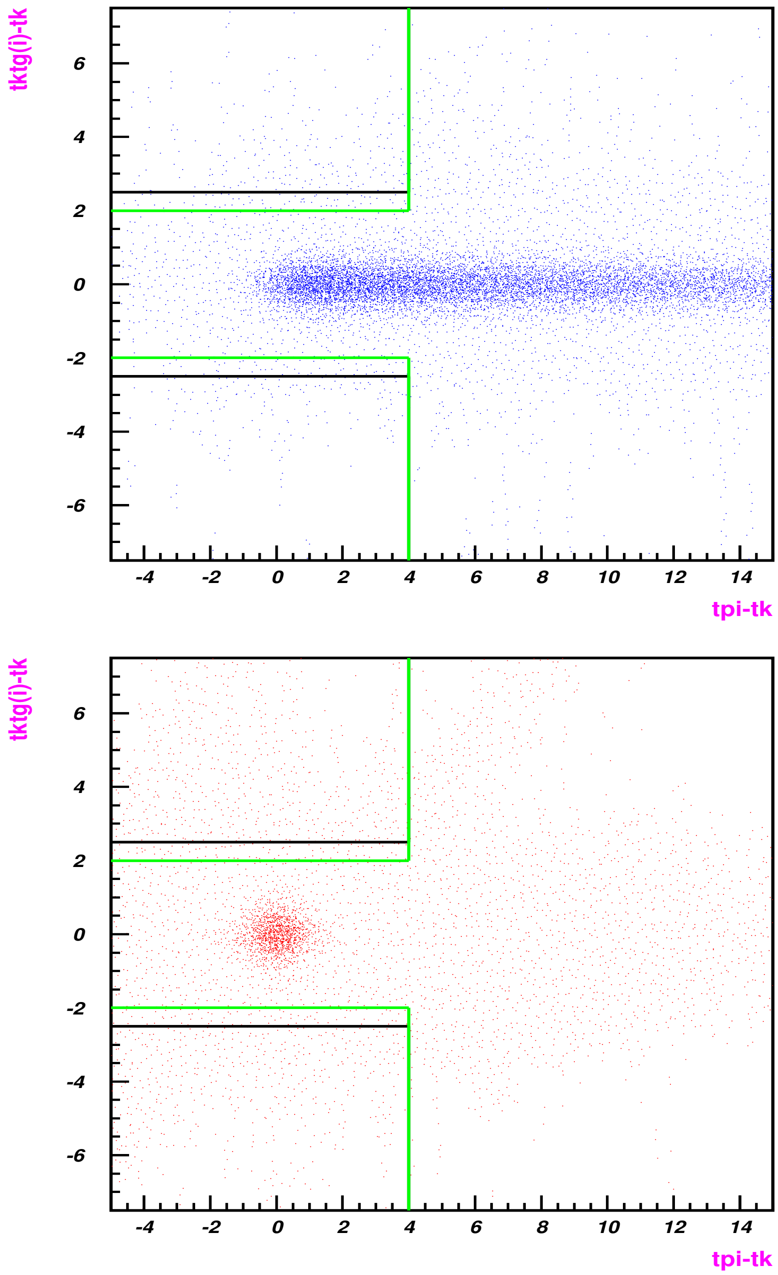
- when the beam likelihood value is less than 200 the delay coincident cut position is kept unchanged.



Cut position checked for category VI

Category VII

- kaon fiber timing consistency

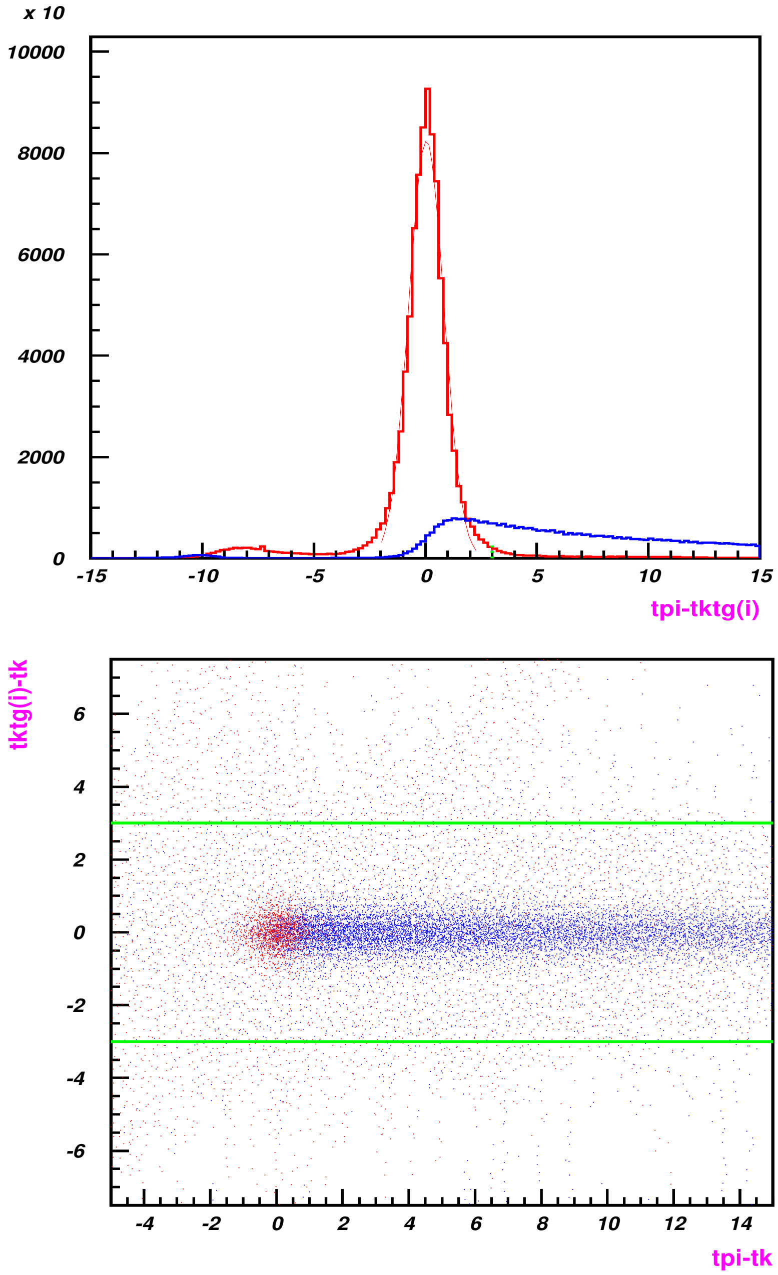


Cut position checked for category VII

TGTCON cut

- kaon fiber timing consistency:

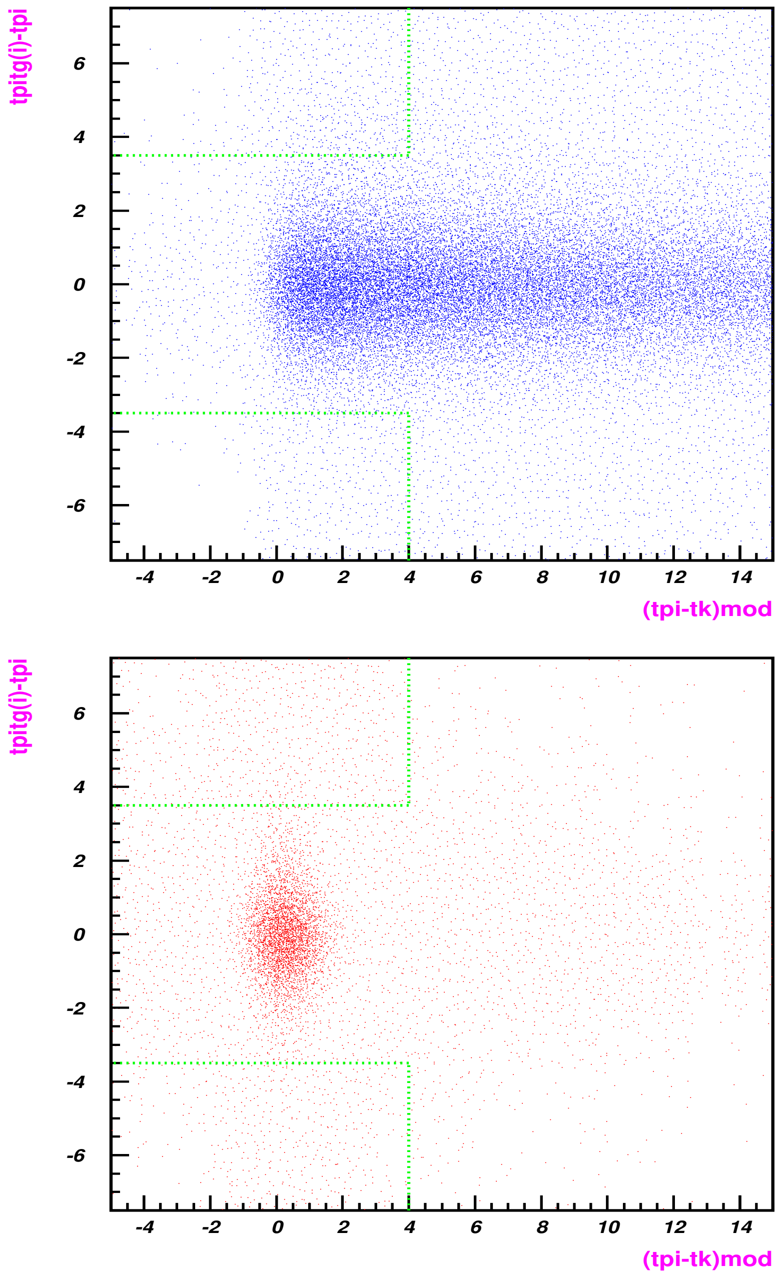
$$|tk\_tg(i) - tk| \leq 3.0 \; ns$$



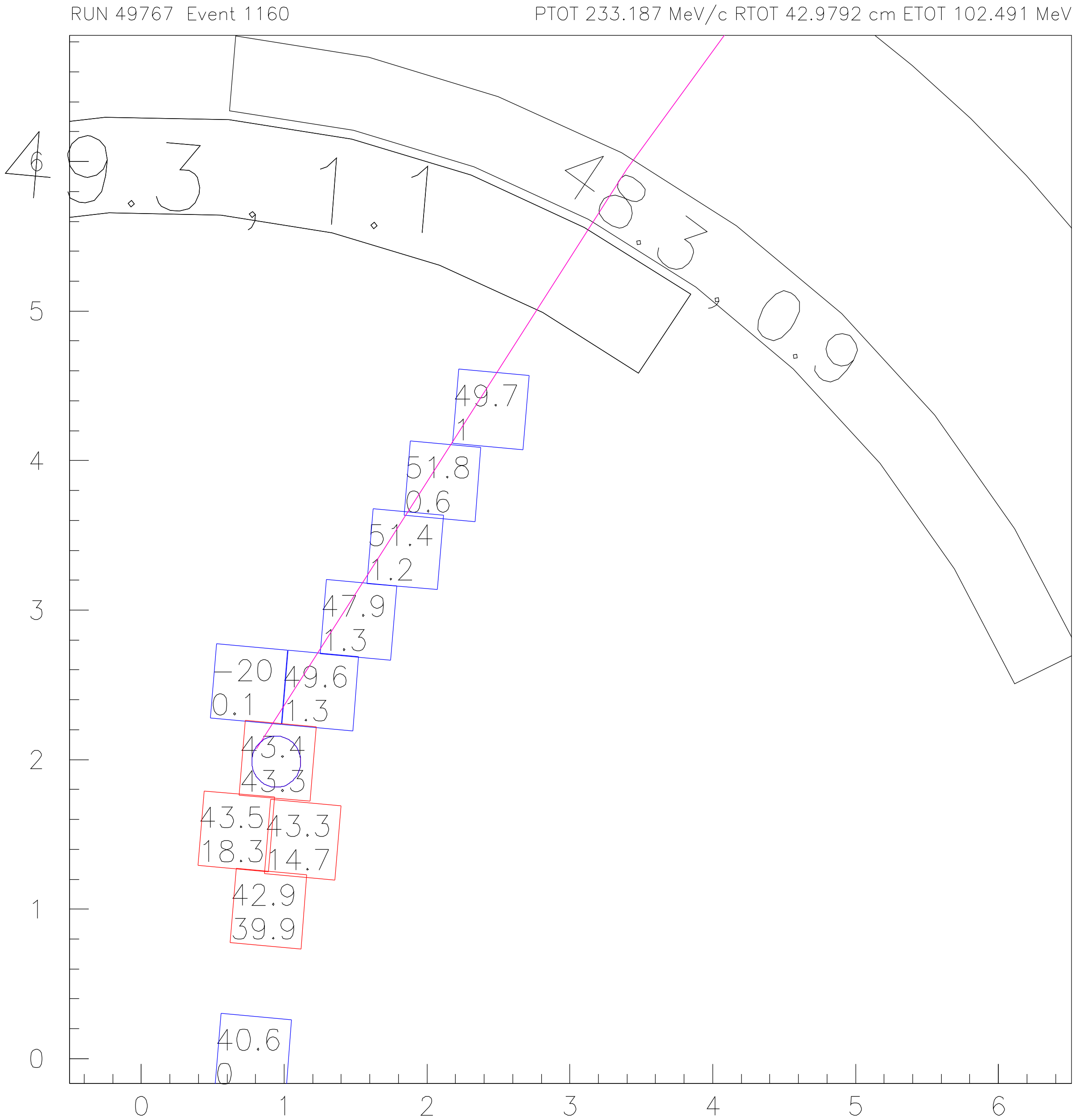
TT kaon fiber timing consistency cut

Category VIII

- pion fiber timing consistency



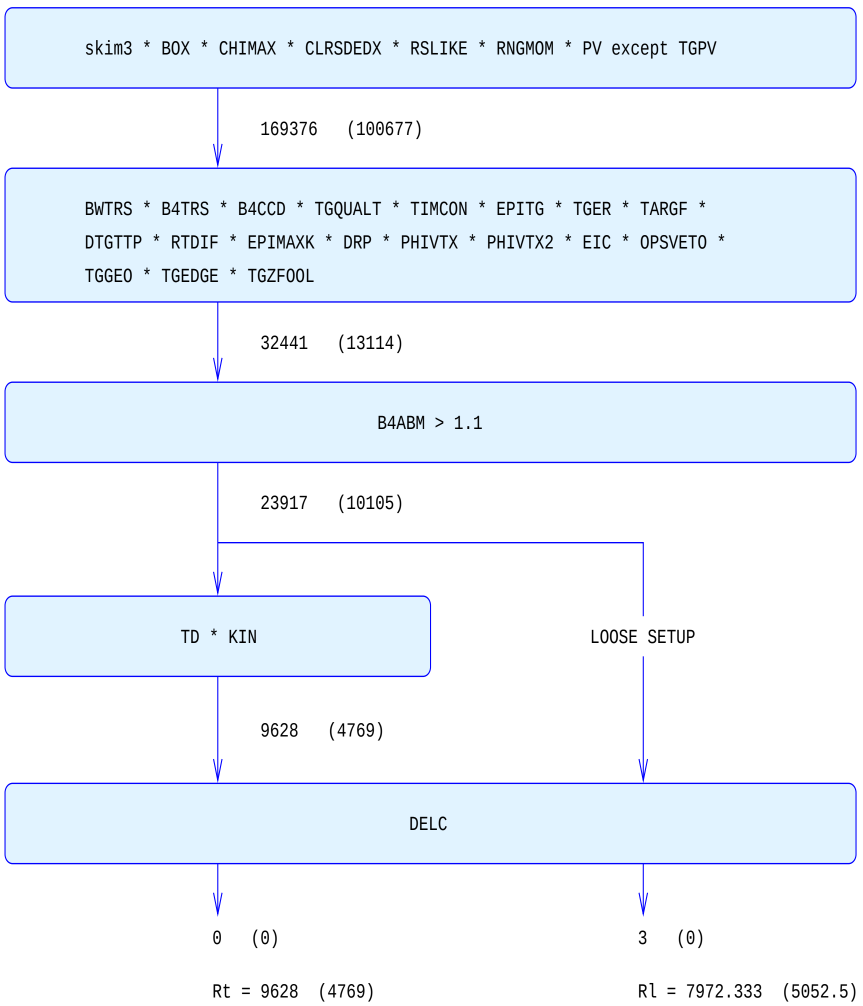
Cut position checked for category VIII



event display- a pion fiber without timing information

Summary

- Acceptance: 86.2% (previous: 83.5%, 98: 88.1%)
- Rejection: 7972.3 (98: 5052.5)
- Improvement to expect:
  - ☐ a new beam likelihood map
  - ☐ better tk and tpi measurements



Single beam rejection (# in parenthesis is for 98 data)