ev5 – electron finding routine

Acceptance and Rejection samples

ev5 worked with two modified "old" and new ("triangle") cuts as was described at the previous videomeeting. No BVL, TD usage yet.

Acceptance sample: `SKIM6 -PSCUT02 PVCUT02 TDCUT01_NOEV5 KINCUT01`
Then additional cuts listed in the table were added

Additional Cuts	$T_e < 6.6\,\mu s$		$T_e < 10\,\mu s$	
	Accep.	Opp.acc.	Accep.	Opp.acc.
$\cdot(\lvert dt1\rvert < 2.0)\cdot$ns				
$\cdot(tmuav1 > 15)$	80.7%	8.5%	**83.5%**	11.5%

Prev. monitor piscat results:	79.6%	10.4%	83.8%	15.0%

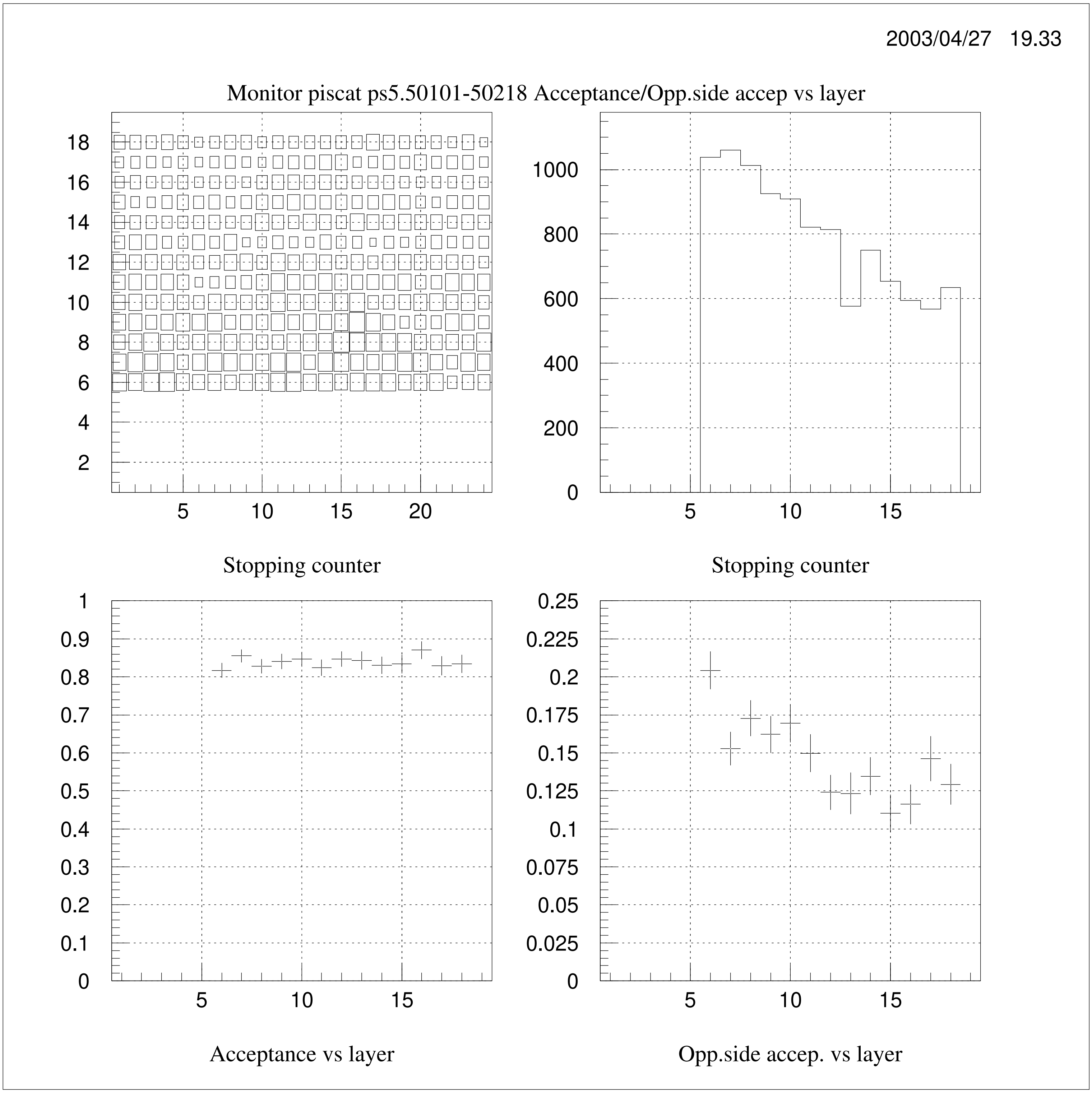
Rejection sample: `SKIM5 PSCUT02 PVCUT02 TDCUT01_NOEV5 -KINCUT01`
Then additional cuts listed in the table were added

Additional Cuts	$T_e < 6.6\,\mu s$		$T_e < 10\,\mu s$	
	Accep.	Opp.acc.	Accep.	Opp.acc.
$(fiducial\ cuts) \cdot (lay14) \cdot$				
$\cdot(ptot > 225.0 + \overline{rngmom'})$				
$\cdot utcqual \cdot utcfit \cdot eic \cdot pigap$	41.6%	7.5%	**44.3%**	**9.6%**

$$R = 2.26$$

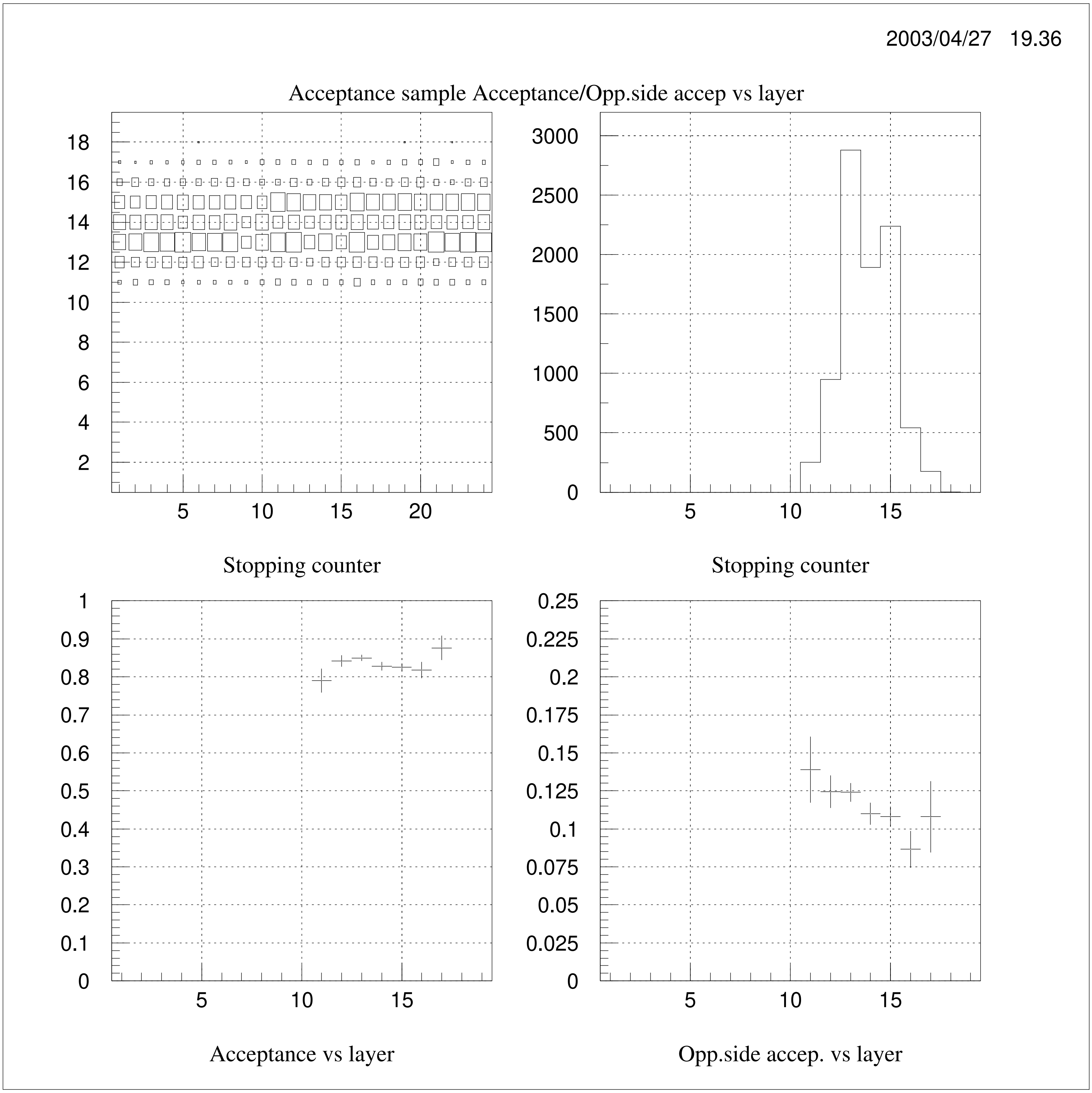
ev5 – electron finding routine

Some distributions for monitor piscat



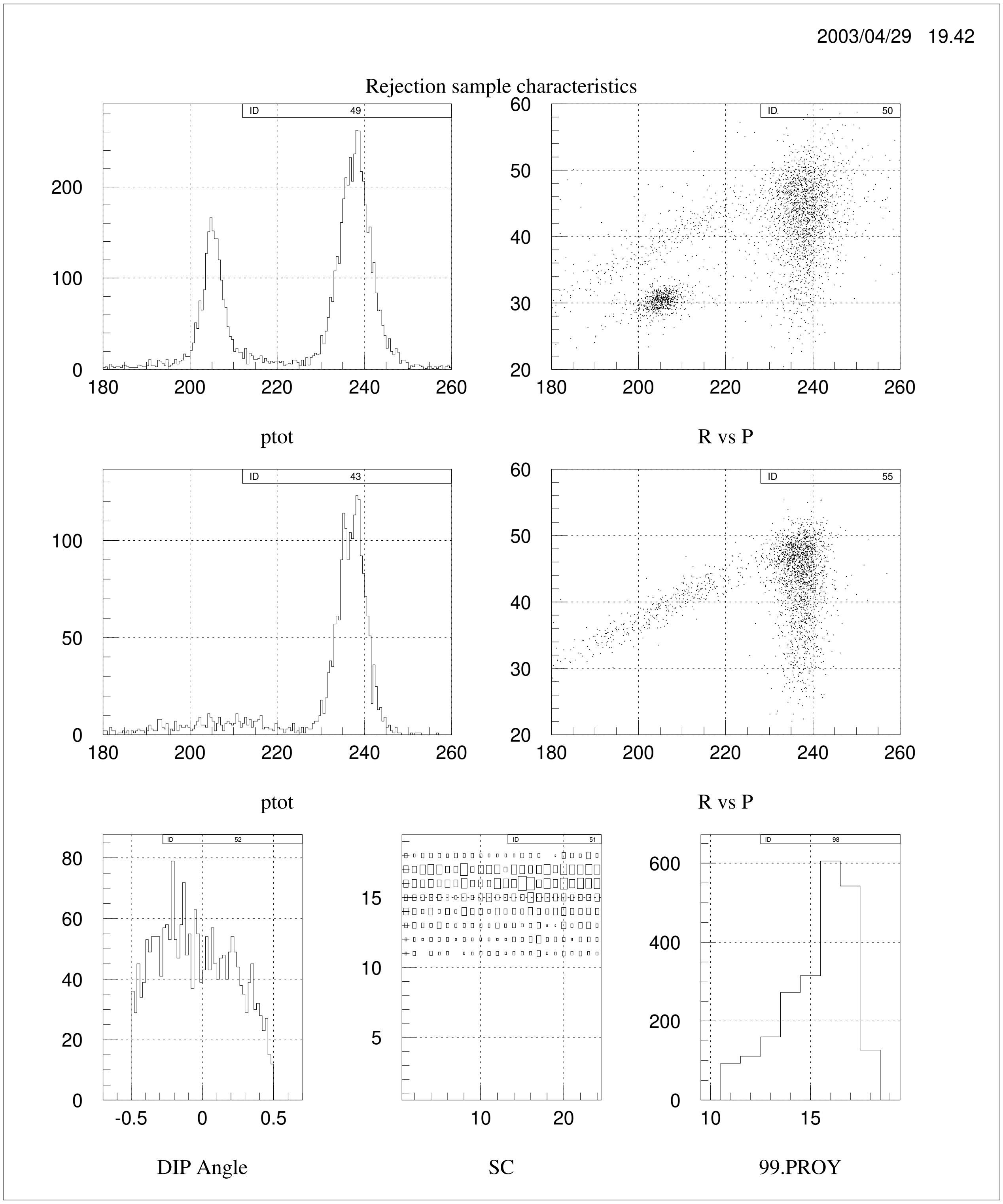
ev5 – electron finding routine

Some distributions for Acceptance Sample



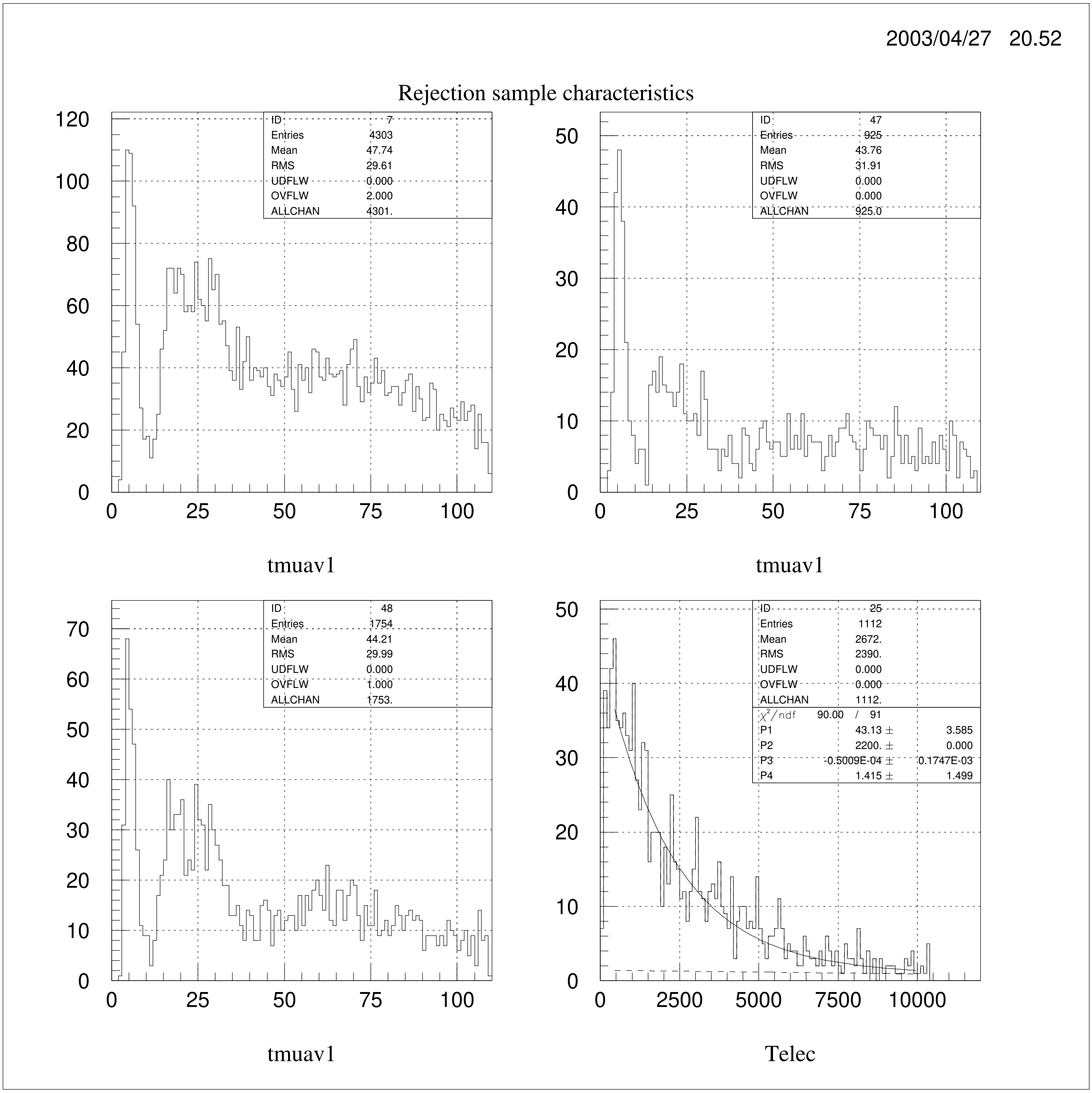
ev5 – electron finding routine

Rejection Sample before/after additional cuts



ev5 – electron finding routine

Muon/electron times for Rejection Sample



ev5 – electron finding routine

Estimation of decayed/non-decayed muon fractions in rejection sample

Events with stopped muons that passed TDCUTs can be divided to two fractions:

1. Muon survived after what was considered as "muon time" and would decay. As concerns ev5, these events should be no diffent from stopped pions events. So is its ev5 acceptance. Usually refered to as:
   - muon-time accidental
   - pion-time accidental
   - tail-fluctuation
   - GDR
2. Early decay into low energy electron which imitates $\pi \to \mu$ pulse. No muon, no further electron. These events should have acceptance equal to "opposite-side" one which is measured right away. Refered to as:
   - early muon decay

If f - fraction of (1):

$$
\begin{aligned}
0.443 &= f \cdot 0.835 + (1-f) \cdot 0.096 \;\Rightarrow \\
f &= 0.469
\end{aligned}
$$

Fraction	Stream composition		
	Initially	Accepted by ev5	Rejected by ev5
1.	47.%	88.% (39.%)	14.% (8.%)
2.	53.%	12.% (5.%)	86.% (48.%)

$$R_{max} = 2.55$$

Conclusion

- Remained questions:
  - Why oppisite side acceptance is different for diff. samples (11.5% for pions, 9.6% for muons)
  - Why muons are suppressed in layer 18
  - Why second pulse time looks the same in accepted and rejected by ev5 events in muon sample
- Conclusions
  - ev5 rejection is limited by the presence of considerable fraction of muons which passed TDcuts but not decayed before "muon time". Perhaps, there is no sence for further efforts to improve ev5 rejection power to electron time accidentals.
  - Perhaps we won't gain to much of introduction of BVL.