L3 Muon filter Online

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on behalf of the L3 Muon team

L3 Algorithms meeting
April 24, 2002

- Recent progress
- Current status
- Outlook

- included and tested new dynamic unpacker ($\rightarrow$ p11.04.00)
- fixed 'old' memory leak ($\rightarrow$ p11.04.00)
- *lot's of new off-line muon reco code in p11.04.00 including major changes in muon segment finding*
- fixed new crash ($\rightarrow$ p11.04.00)
- 'RCP patched' new, giant memory leak ($\rightarrow$ p11.04.01) ignore MDT modules with more than 30 hits
- *Apr.8: online L3 Muon test run 150554 - 150556 $>$ 30 sec. time-outs, 'online' memory leak?*
- (temporarily) improved timing (p11.04.01 + modified RCP)
- 'online' memory leak cannot be reproduced off-line
- *Apr.19: online L3 Muon cosmics test run 151791 no time-outs, memory leak not confirmed*
- Improved Muon Code Management procedures in place
- Documentation for (p11.04.01 + modified RCP) = (p11.05.00 + modified RCP) = p11.06.00
- to do: online test run with forward muons (tomorrow)

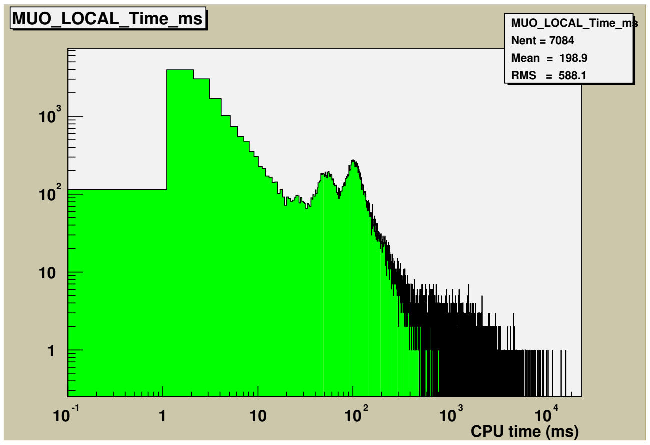
Current Status

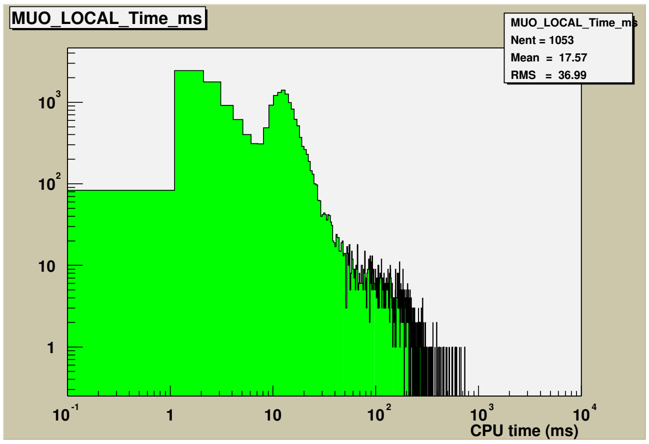
- See documentation (p11.04.01 + modified RCP) = (p11.05.00 + modified RCP) = p11.06.00

- unpacking → smooth online running OK
- robustness online & offline OK
- memory leak ?... will know tomorrow
- timing OK, numbers to be revised with proper treatment L1 bits
- efficiency, rejection OK
- data persistency & effect on other tools ??
- Muon code management procedures

Modified RCP parameters ($\rightarrow$ p11.06.00) to improve CPU time consumption.

CPU time muo_local tool:





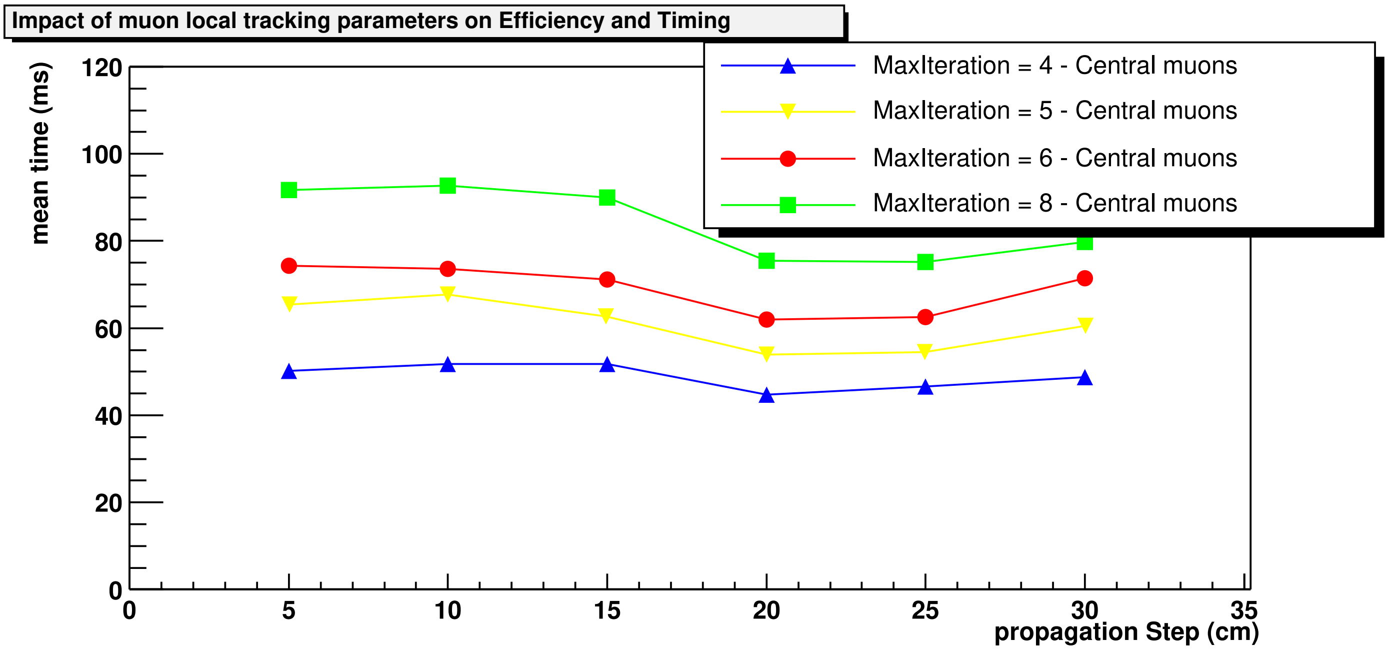
Default | modified RCP

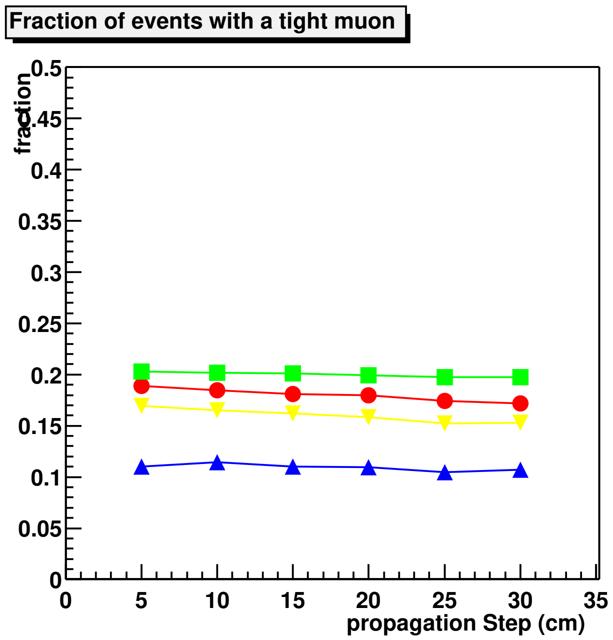
average time: 199 ms | average time: 18 ms

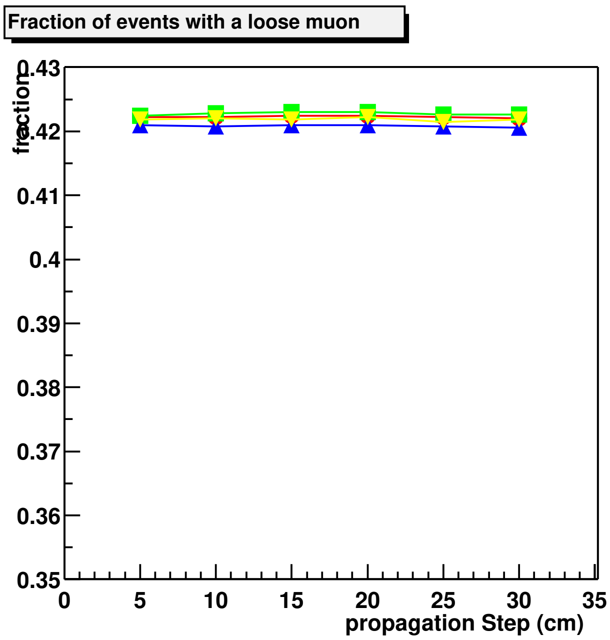
(run 150566, L1 forward muon trigger,
Pentium III 1 GHz, compiled with Maxopt)

Local Muon track finding parameters:

Offline default:	MaxIteration = 20, PropStep = 1 cm
L3 default:	MaxIteration = 6, PropStep = 10 cm
L3 modified RCP:	MaxIteration = 6, PropStep = 20 cm

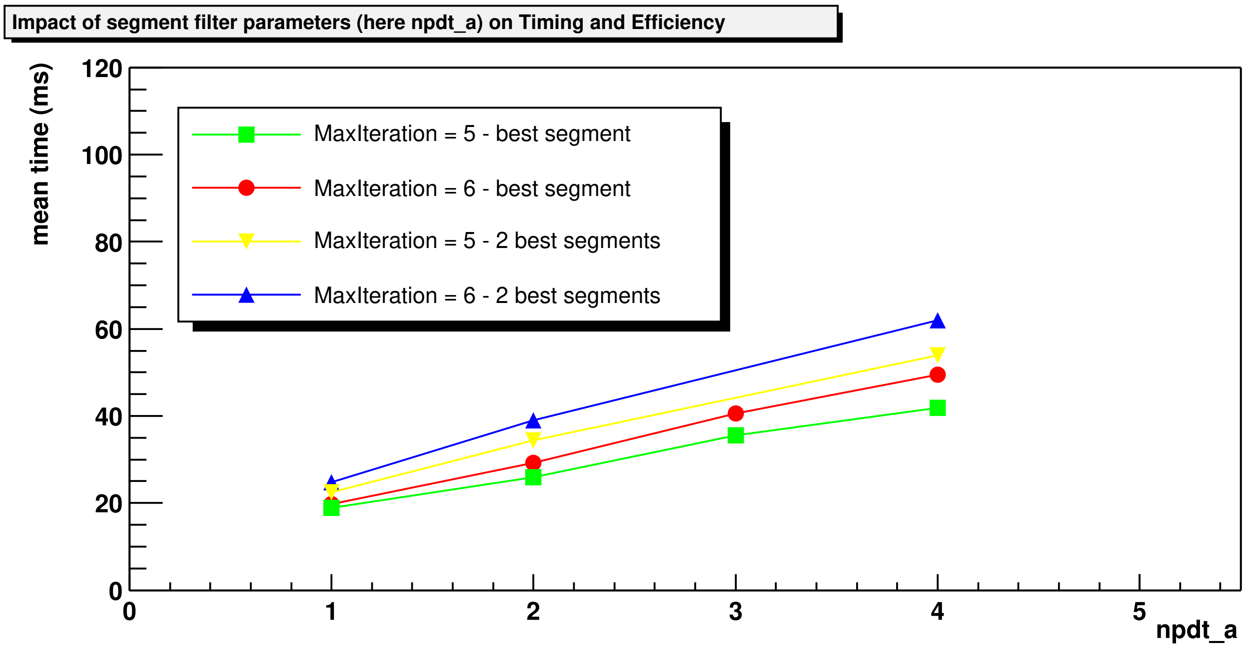


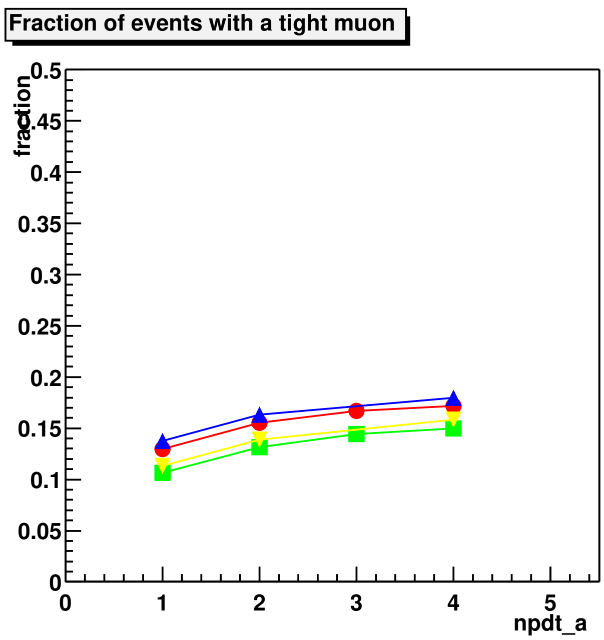


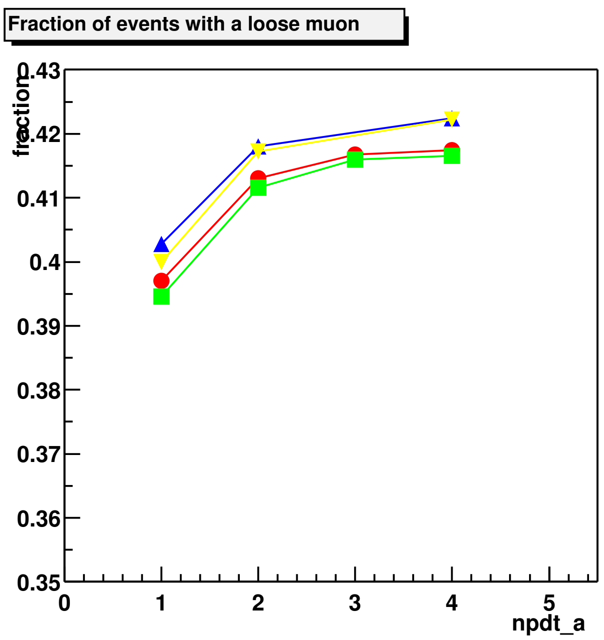


Segment finding (similarly for MDTs):

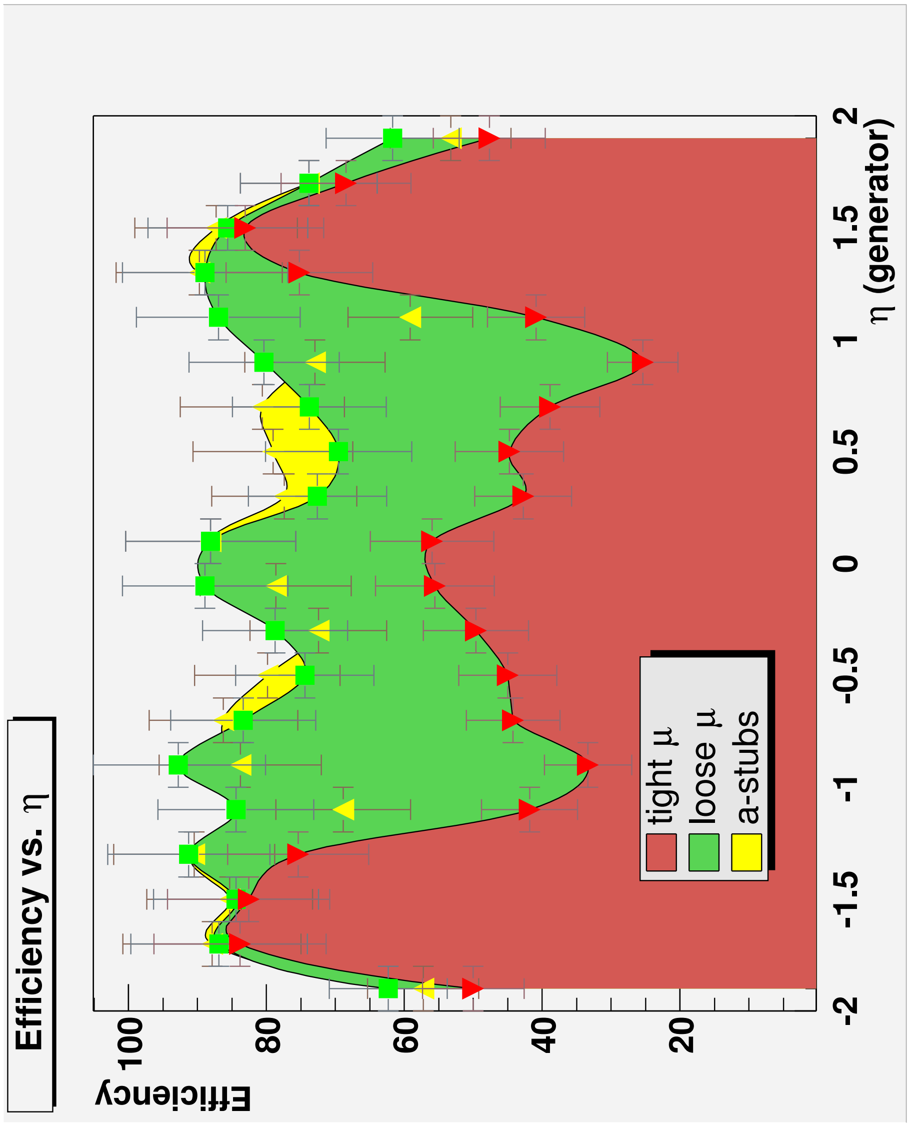
Default	modified RCP
npdt = 2	npdt = 1
npdt_a = 4	npdt_a = 1
npdt_pre = 10	npdt_pre = 1





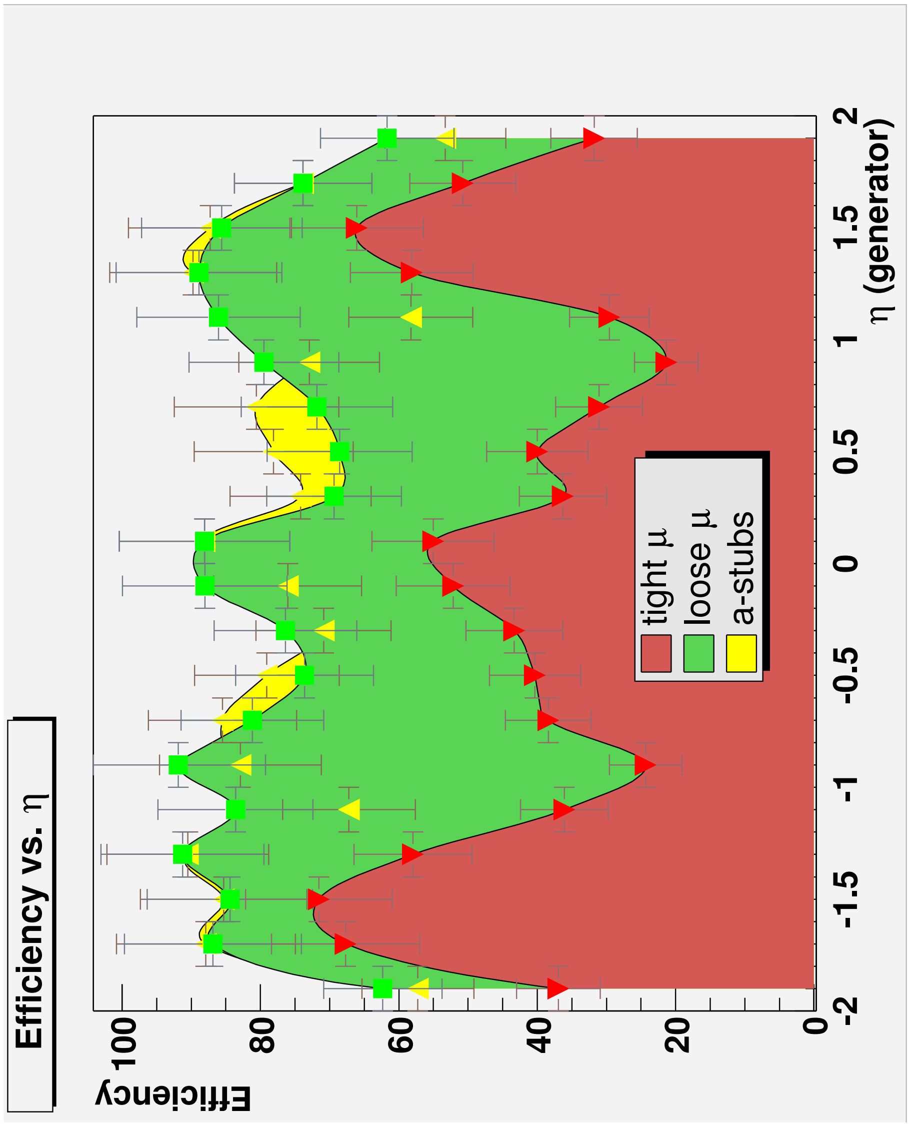


Efficiency, default RCP settings:



(5000 events, single muon MC)

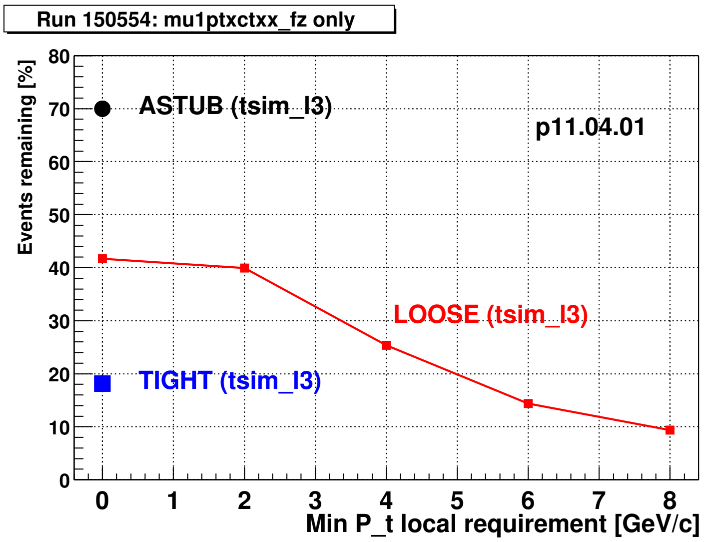
Efficiency, modified RCP settings:

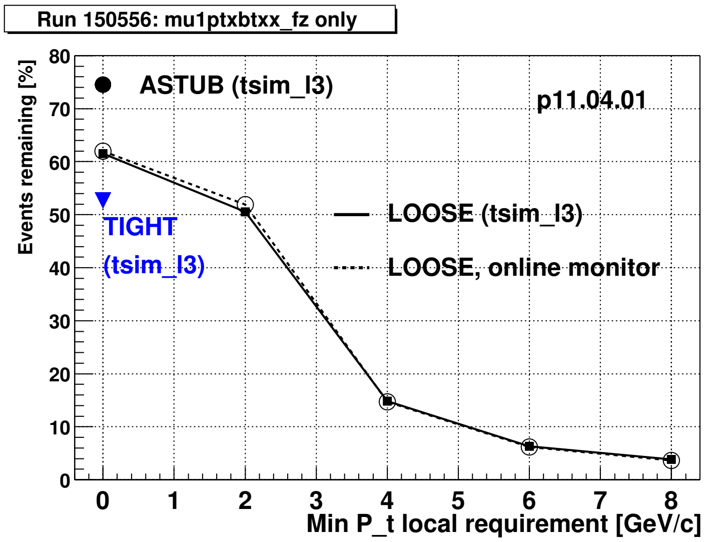


(5000 events, single muon MC)

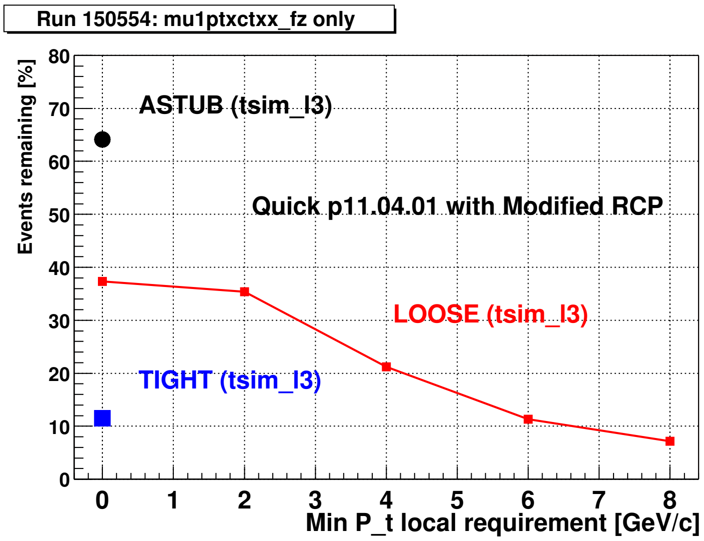
Modified RCP parameters: Rejection

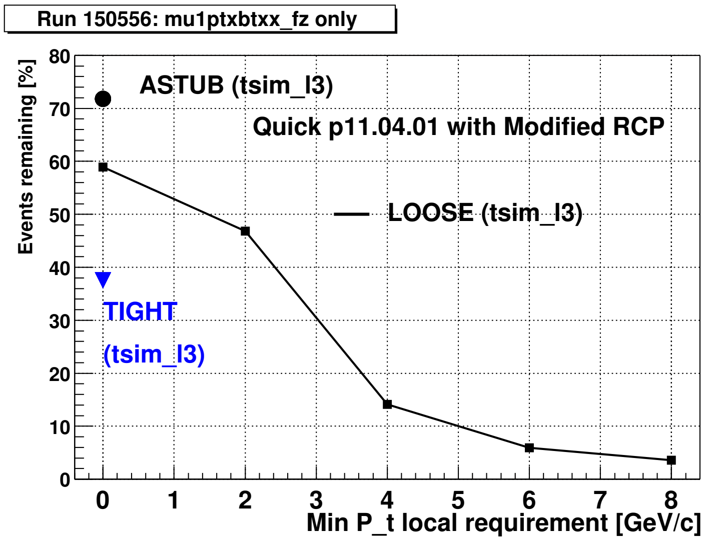
1/rejection with default RCP settings:





1/rejection with modified RCP settings:



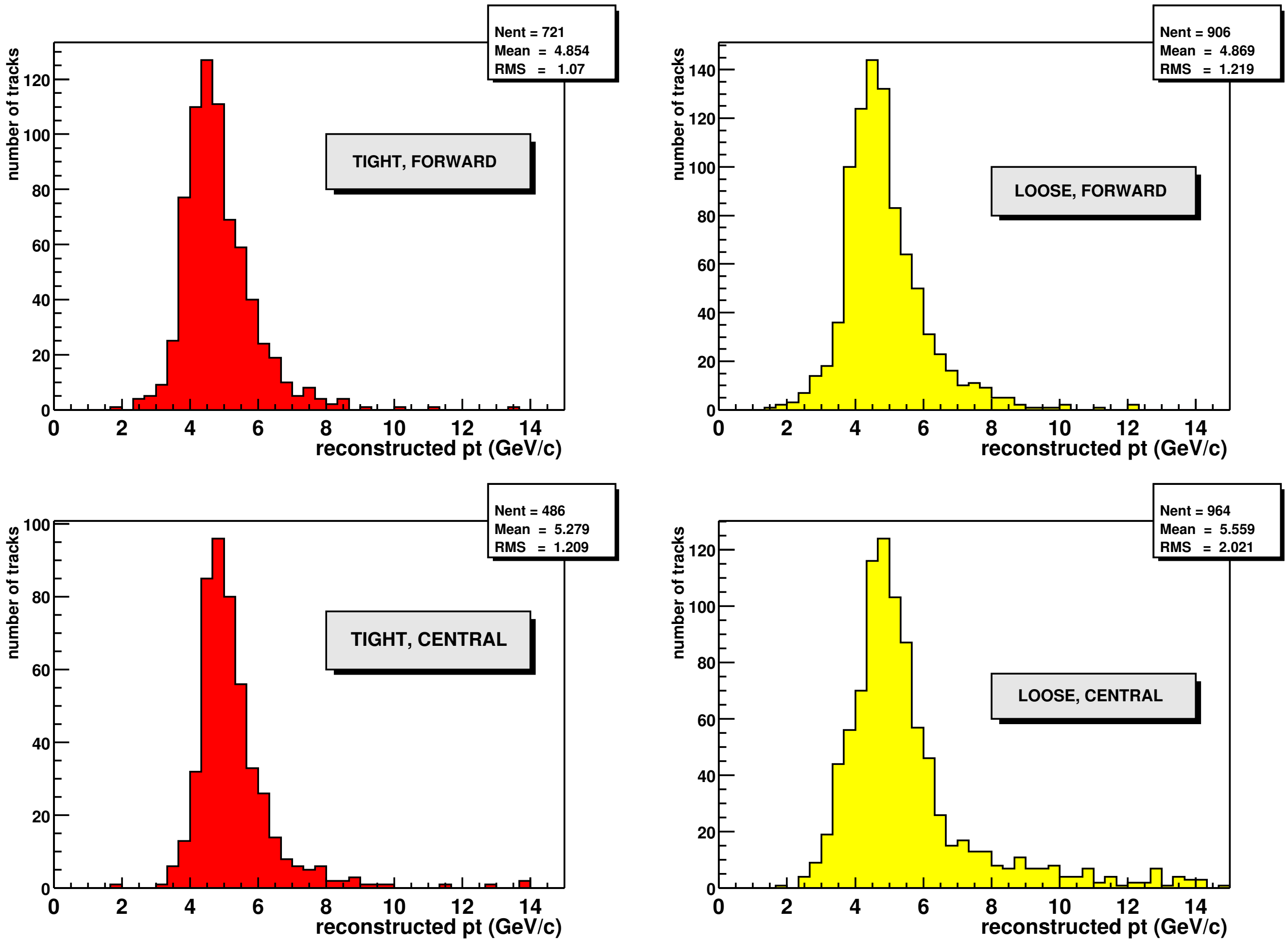


LOOSE rejection factor w.r.t. L1: 2.5 central, 1.7 forward

Stronger rejection achievable with cut on pt

Modified RCP parameters: Resolution

local muon pt resolution:



(single muon MC, pt=5 GeV/c)

Proposal for Managing Muon Code in Future Releases:
(Linda Stutte, Christophe Royon, Daria Zieminska, Martijn Mulders, Terry Wyatt, Harry Melanson)

1. All developers should test their changes to code in the txx.xx.xx releases by running a standard set of macros on test samples which will be defined. These will include J/Psi forward, J/Psi central, a single muon Monte Carlo file and a general raw data run. Reference plots will be available for these samples. These results will be presented at muon algorithm or muonid meetings. At this point, the code release managers will test all proposed changes together. If all is OK, the changes will be approved for the next t build.

2. For production releases, more care is needed since these releases run both online for L3 and on the farms. Here developers must submit a proposal for changes wanted to the code release managers before modifying the production branch. If approved, the same testing steps outlined above the t releases must be made. In addition, the L3 Muon contact person must perform his memory and timing checks. If all is OK, the code release managers will approve these changes for the next production build by sending a note to Harry Melanson. He has the perogative of accepting these changes or not. N. B. There is no longer the possibility for developers themselves to ask for a bug fix for a production release.

3. At this time, the muon code release managers are Christophe Royon, Linda Stutte and Daria Zieminska. The L3 Muon contact person is Martijn Mulders.

Online: when?

- Tomorrow's online test run crucial $\rightarrow$ IF no memory-leak THEN in good shape
- global_CalMuo-6.00 triggerlist ready with LOOSE muon filters (and 100% mark-and-pass)
- Natural time-scale to go online: with p11.06.00 ?

Then what?

- Learn about online verification / monitoring
- Learn how to do detailed comparisons with off-line
- Interact with physics groups

Other issues:

- Memory leak MDT segments must be fixed.
- Understand why some events took >30 sec.
- Optimise segment and track finding?
- Understand in detail efficiencies, resolutions

Next step: central track matching