Preliminary figures on efficiencies and fakes in p13

Christophe Clément

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- ⇒ New code for segments and tracks in p13
- ⇒ Fakes and efficiency on MC
- ⇒ "Efficiency" on Data
- ⇒ Match over regions

New code for segments and tracks in p13

Improvements in the segment code

⇒ Use angle in drift distance error,

⇒ Segment refitting,

⇒ Allow 2-hit B and C segments before making BC segments,

⇒ Improved segment sorting: old sorting based on number of hits and χ^2, new sorting: BC better than B or C, better than scintillator only. Use χ^2/ndf, if a segment with fewer hits has better χ^2/ndf then the χ^2/ndf must significantly smaller.

Track cleaning

⇒ Tracks allowed to share hits and several segments per detector unit: lead to explosion of number of entries in MuoTrackChunk.

⇒ In p11: cleaning has to be made in ROOT

⇒ In p13: cleaning is in RECO: make groups of tracks sharing N hits and find the best track in the group (R. Ströhmer's code). Each track has a group index, highest quality track has positive index, other tracks have negative index. Track quality uses only muon system info.

Mixed regions tracks

Efficiency and fakes on Monte Carlo

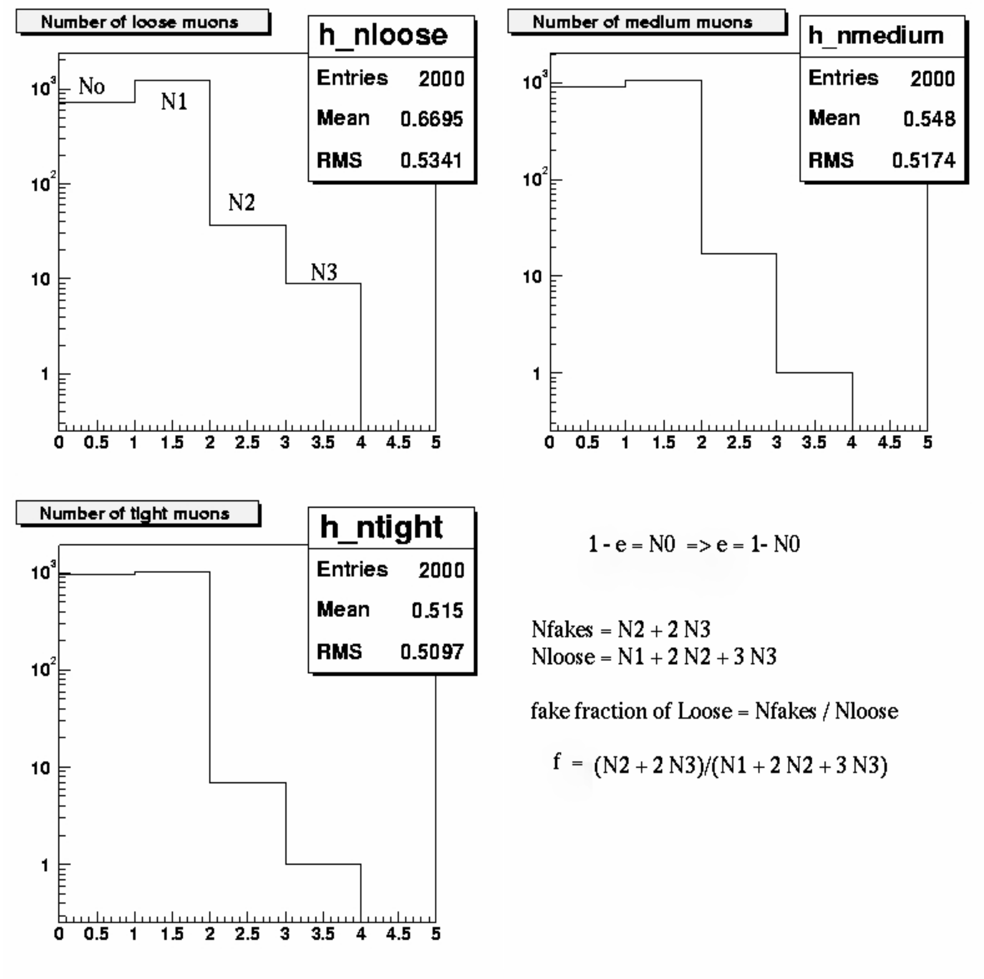
Single muon Monte Carlo

⇒ Single muons with p_T between 5 and 200GeV.

⇒ 1 physical (MC) muon per events.

⇒ How often 0 muons are found gives 1-e,

⇒ Number of fake loose, medium and tight extracted from the number of loose, medium and tights per events.



Efficiency in MC

Efficiency e in % for: loose, medium, tight per 100 MC muon			
Release	Loose	Medium	Tight
p10.15.03	88/76	75/72	67/71
p11.12.00	90/86	75/76	66/74
t02.35.00 2 hit sharing	91/87	75/78	67/78
t02.35.00 mixed regions	90/86	74/74	66/74

Fakes in MC

Nbr of fake per 100 loose, medium, tight muons			
Release	Loose	Medium	Tight
p10.15.03	4/2	0.1/0.1	<0.001/0.001
p11.12.00	13/16	4/2	3/0.7
t02.35.00 2 hit sharing	8/5	3/1.1	1.4/0.9
t02.35.00 mixed regions	6/3	2/1.3	0.7/0.9

⇒ **Fakes** are produced by the algorithm, not by cosmics, jets...

⇒ In p11 remove double counting at ROOT level.

⇒ In p13, remove double counts in RECO. Some remaining fakes. Needs some fine tuning, under investigation.

⇒ Mixed regions muons: different behaviors in MC and Data?

Efficiency on Data

Data run 160588

⇒ We can only count the number of loose, medium and tight muons,

⇒ Clean double count in macro for p11

⇒ Use muon group variable from t02.35.00

Nbr loose, medium, tight per 100 events			
Release	Loose	Medium	Tight
p10.15.03	24	23	17
p11.12.00	23	19	13
t02.35.00 2 hit sharing	36	28	22
t02.35.00 match over regions	34	27	22

Statistically significant increase of the number of tight muons!

Medium/Tight is at the 80% level (70% previously)

To do list

- ⇒ Recompute efficiencies and fakes with new t→d and new TOF calibration,
- ⇒ Look at efficiency/fake on scanned sample,
- ⇒ Estimate efficiency on data sample: 2 tracks and 1 matched with local muon, with invariant mass of tracks at Z mass.
- ⇒ Fine tune RCPs for segment and track cleaning (efficiency versus fakes).