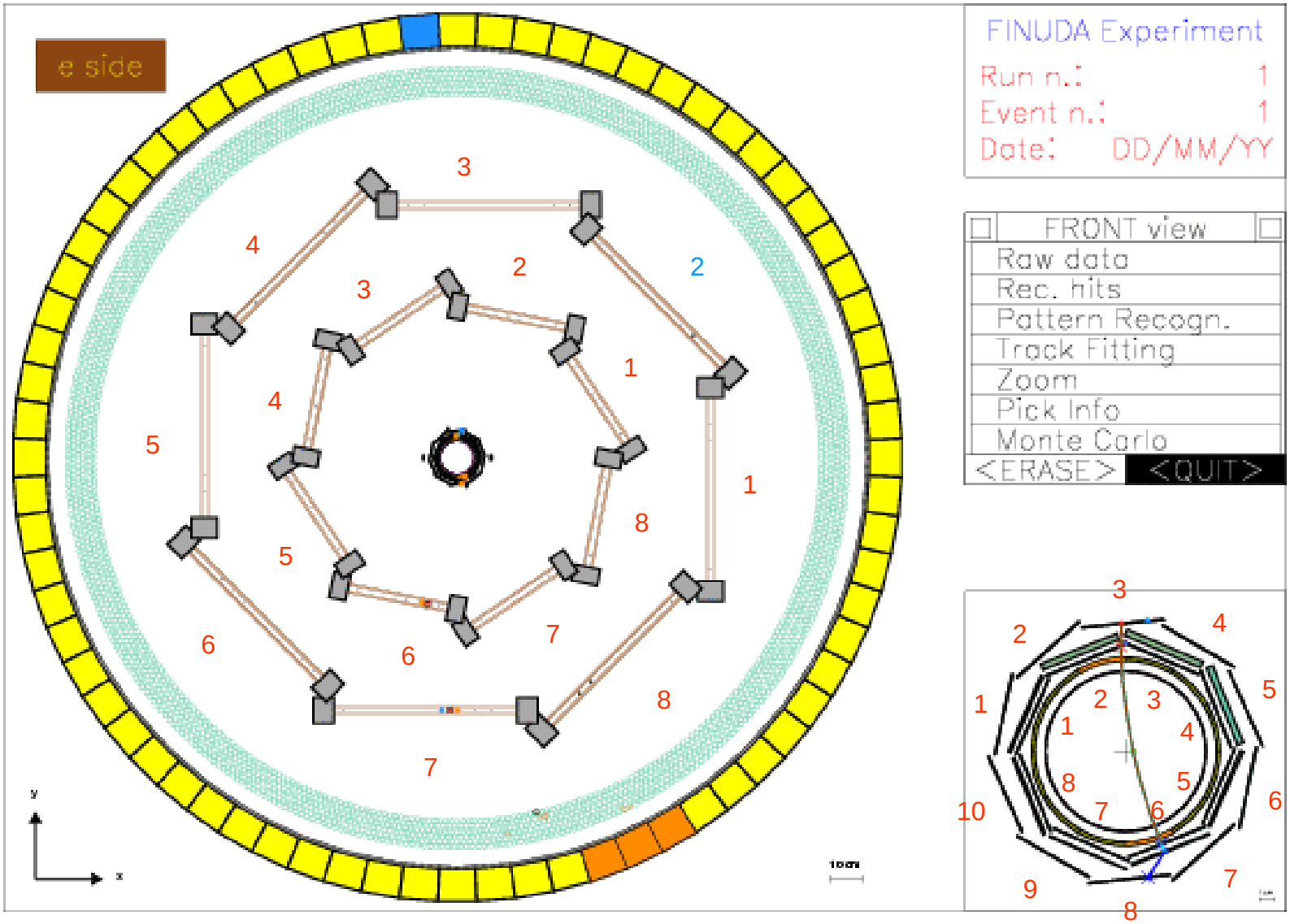
FINUDA collaboration meeting

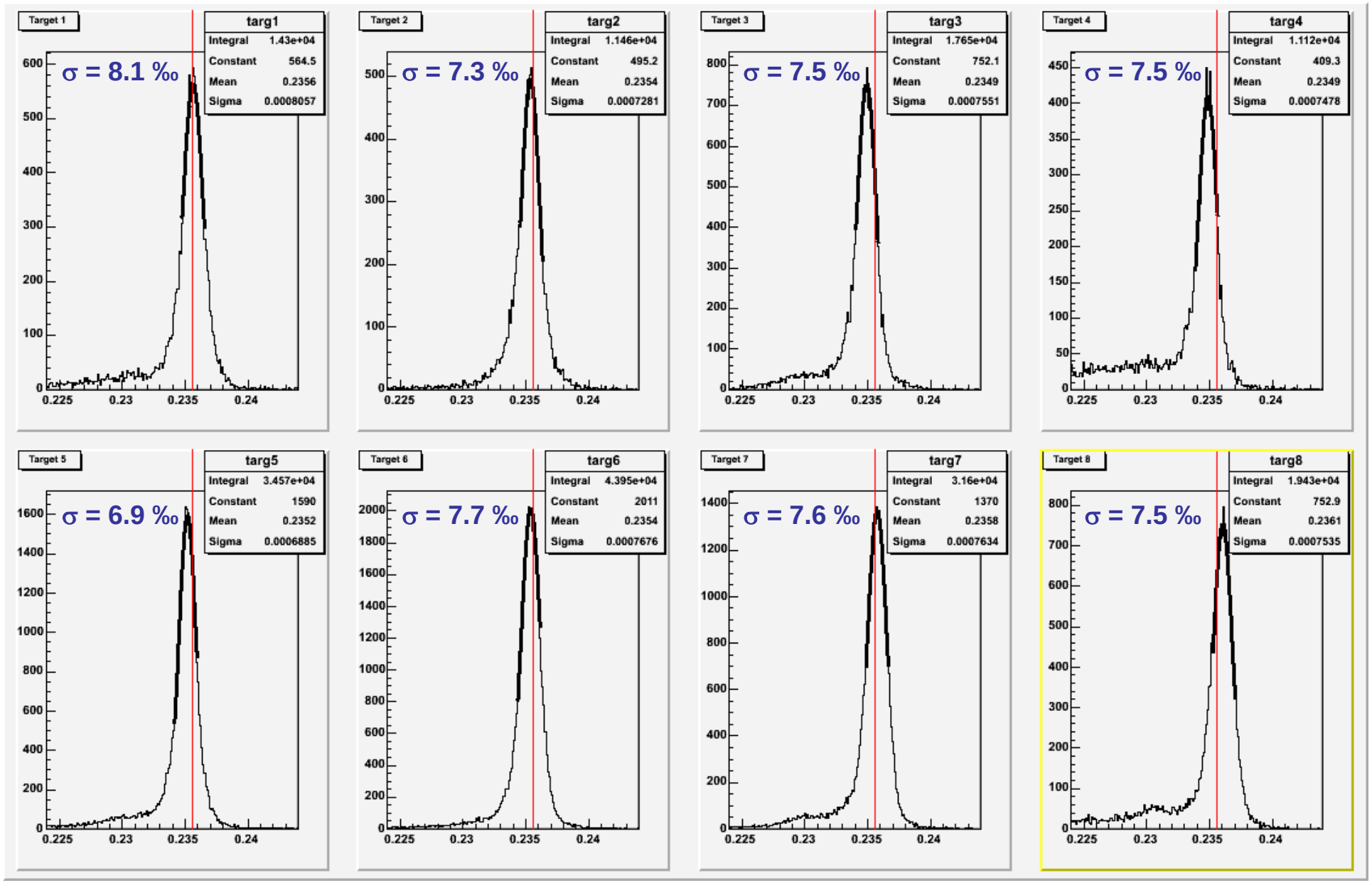
LNF, Frascati, 20/21 October 2004



momentum resolution

μ^+ per target

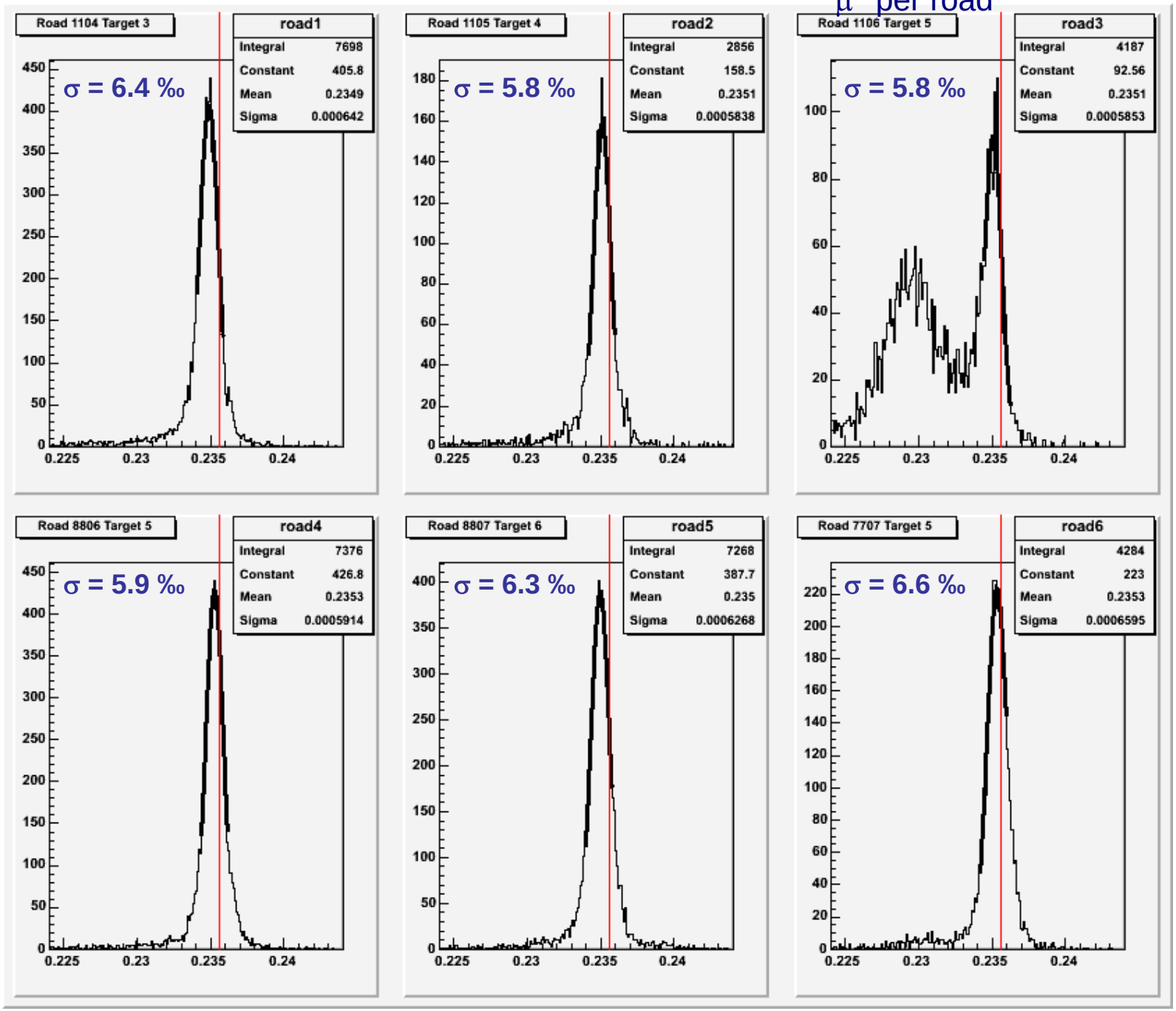
cuts: extrmin=1, stopplu=1, chrgplu=1, stermin<200, resdmin<0.2, normmin<60



momentum resolution

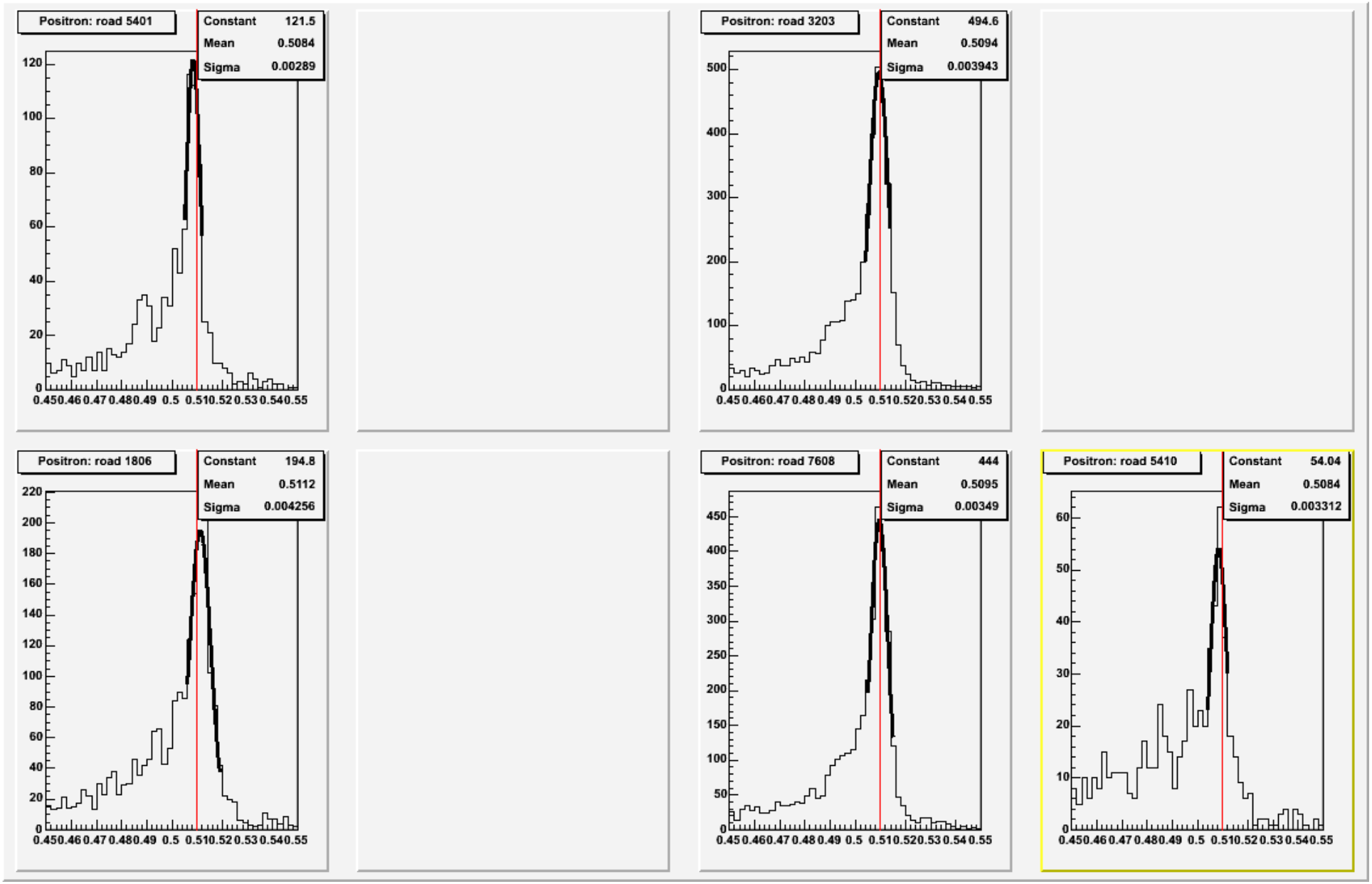
μ^+ per road

cuts
extrmin=1
stopplu=1
Chrgplu=1
stermin<200
resdmin<0.2
|lammin|<20



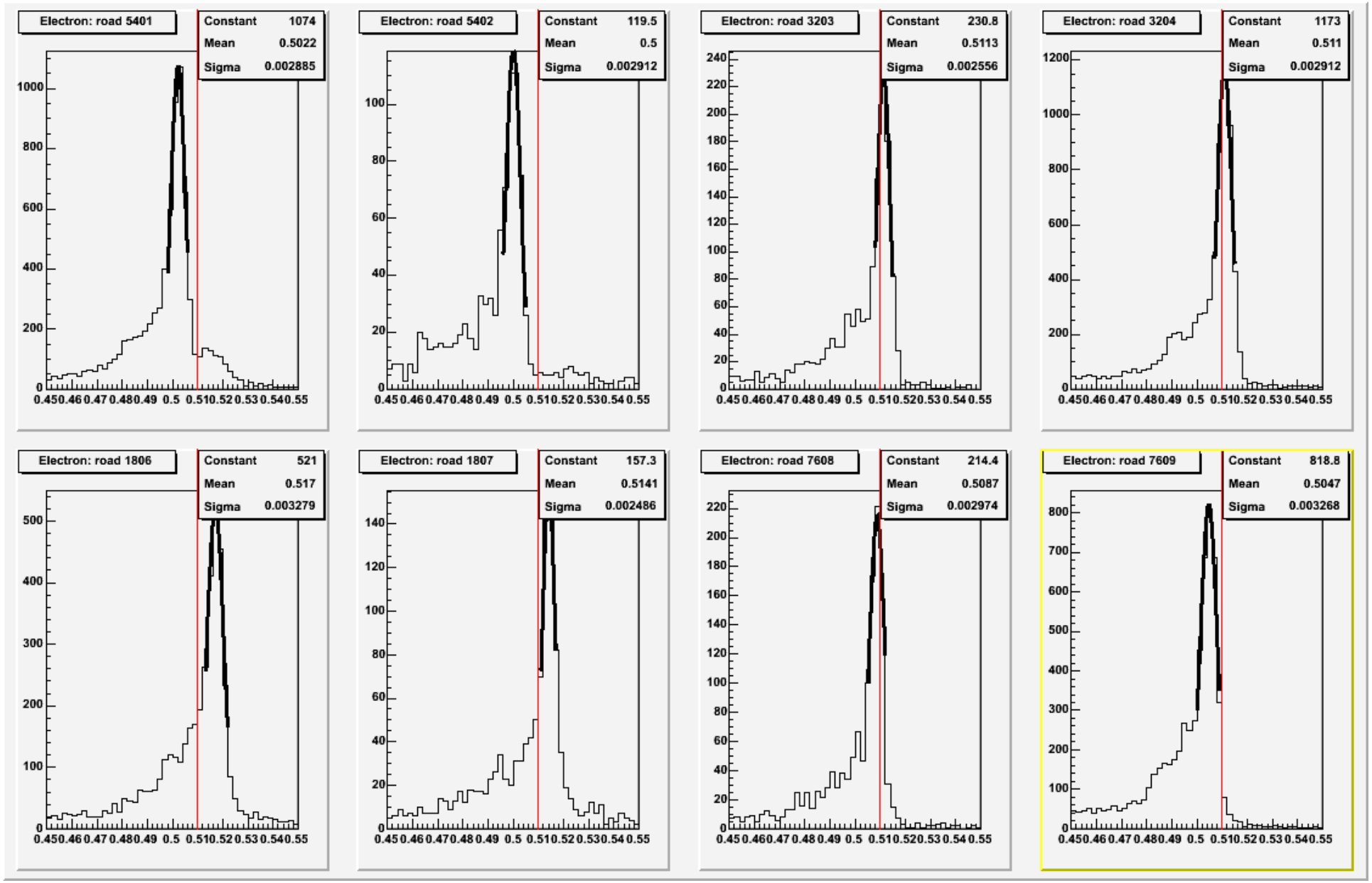
momentum resolution

bhabha $^{+}$ per road



momentum resolution

bhabha ¯ per road

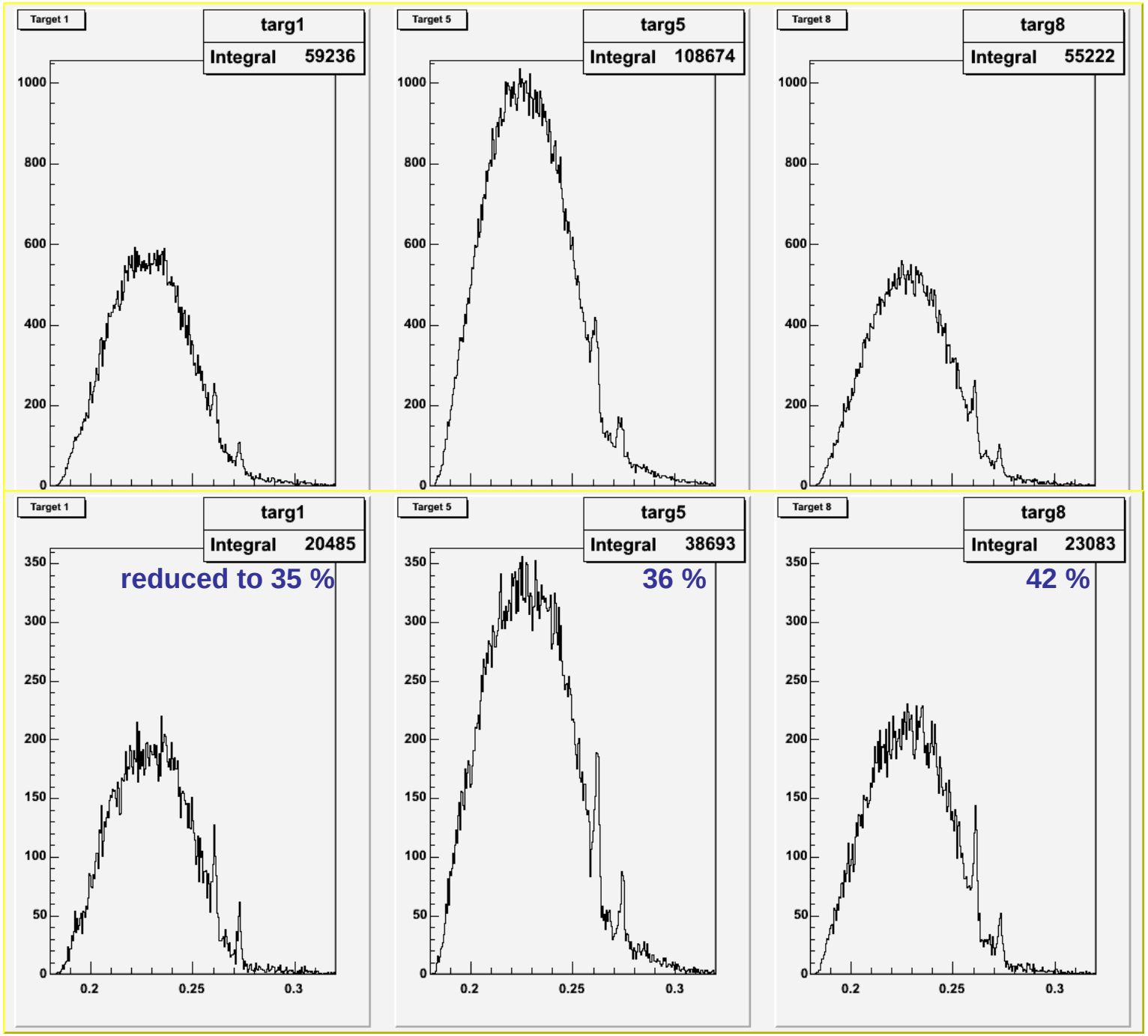


all momentum spectra for different cuts

$\pi^- \, {}^{12}_{\Lambda}C$ momentum distributions

"no cuts"
extrmin=1

"loose cuts"
extrmin=1
stermin<2000
resdmin<0.5
dev2min<100
normmin<80

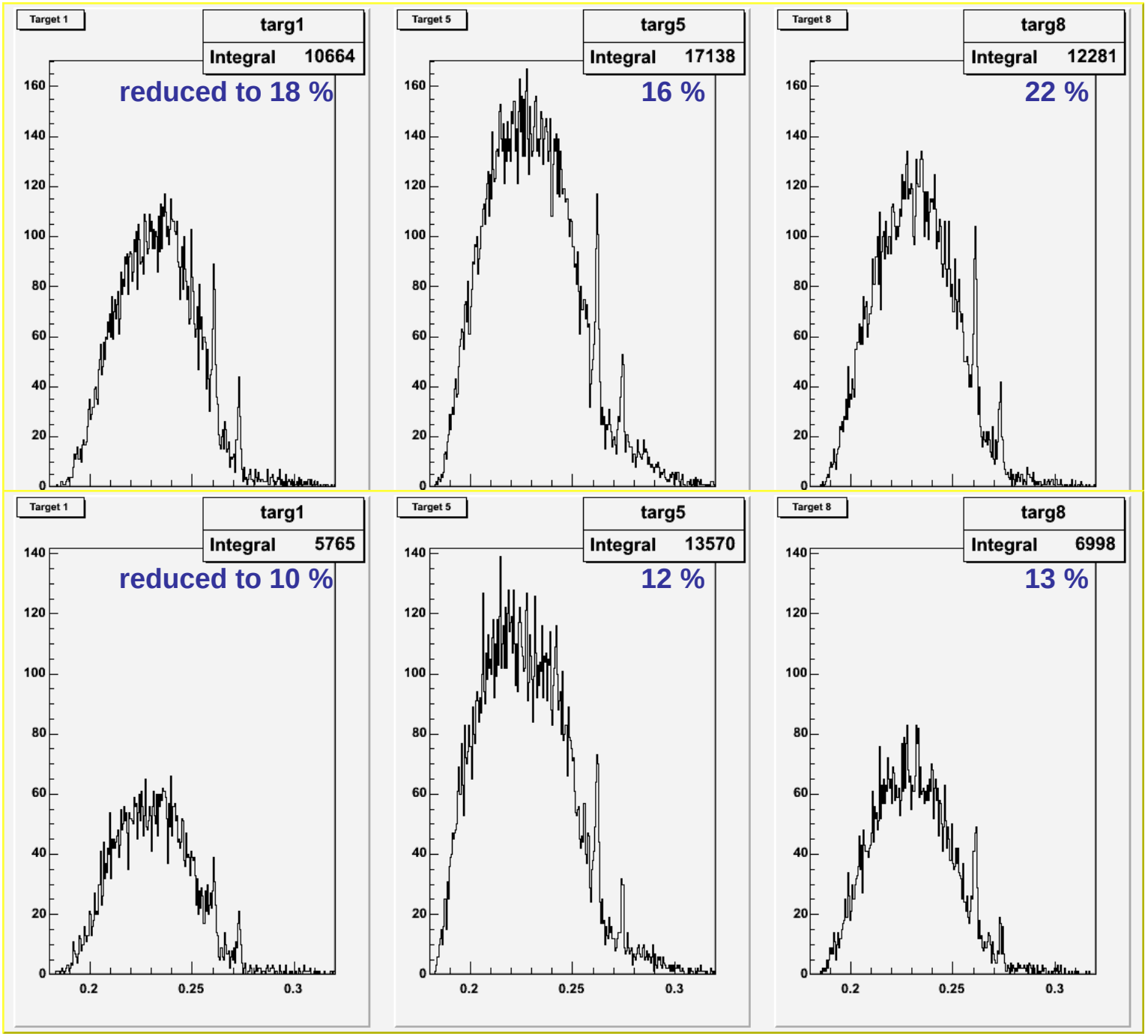


all momentum spectra for different cuts

$\pi^- \, {}^{12}_{\Lambda}C$ momentum distributions

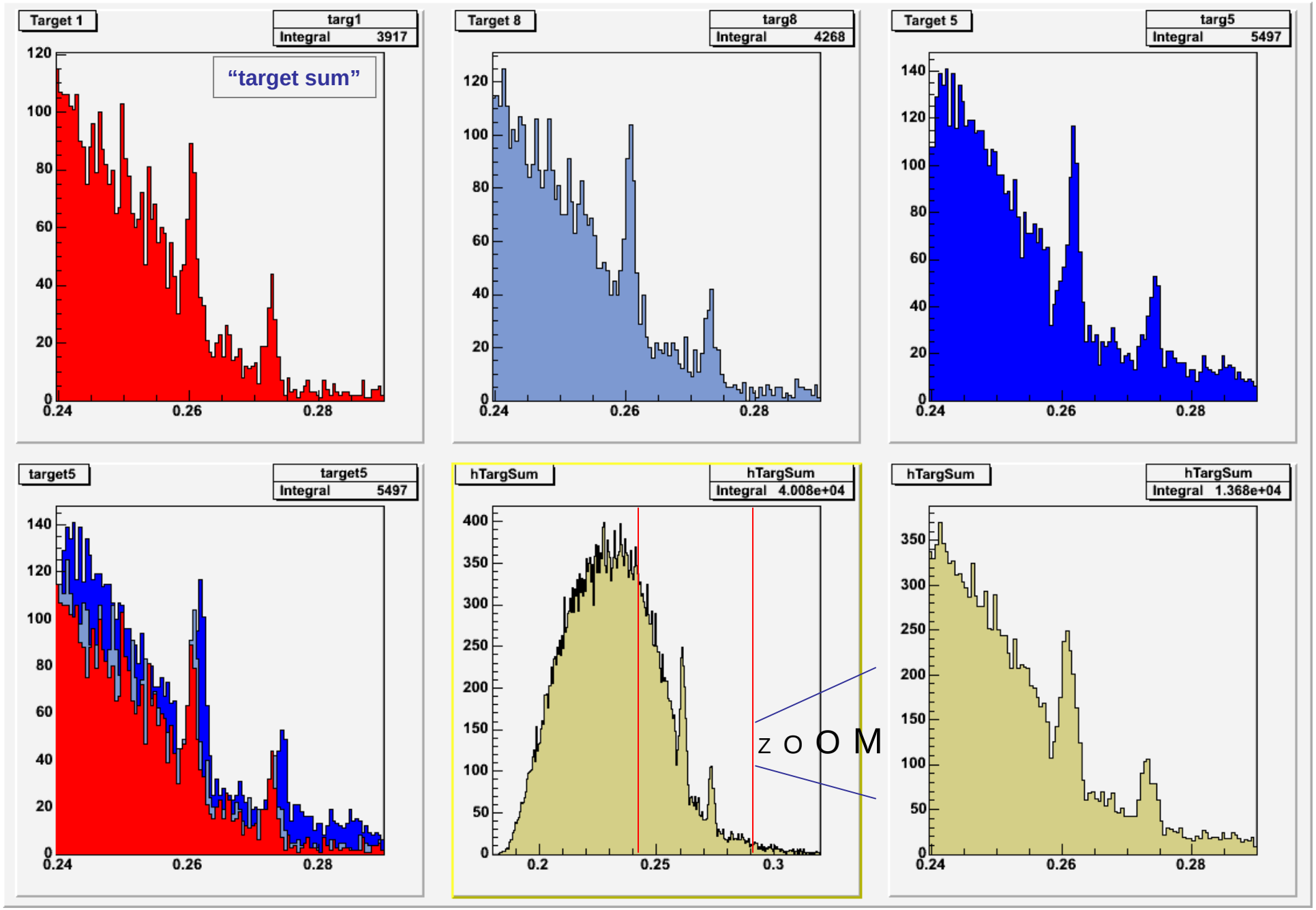
"best cuts"
extrmin=1
stermin<300
resdmin<0.15
normmin<60

"tight cuts"
extrmin=1
stermin<200
resdmin<0.1
dev2min<30
normmin<80
|lammin|<15



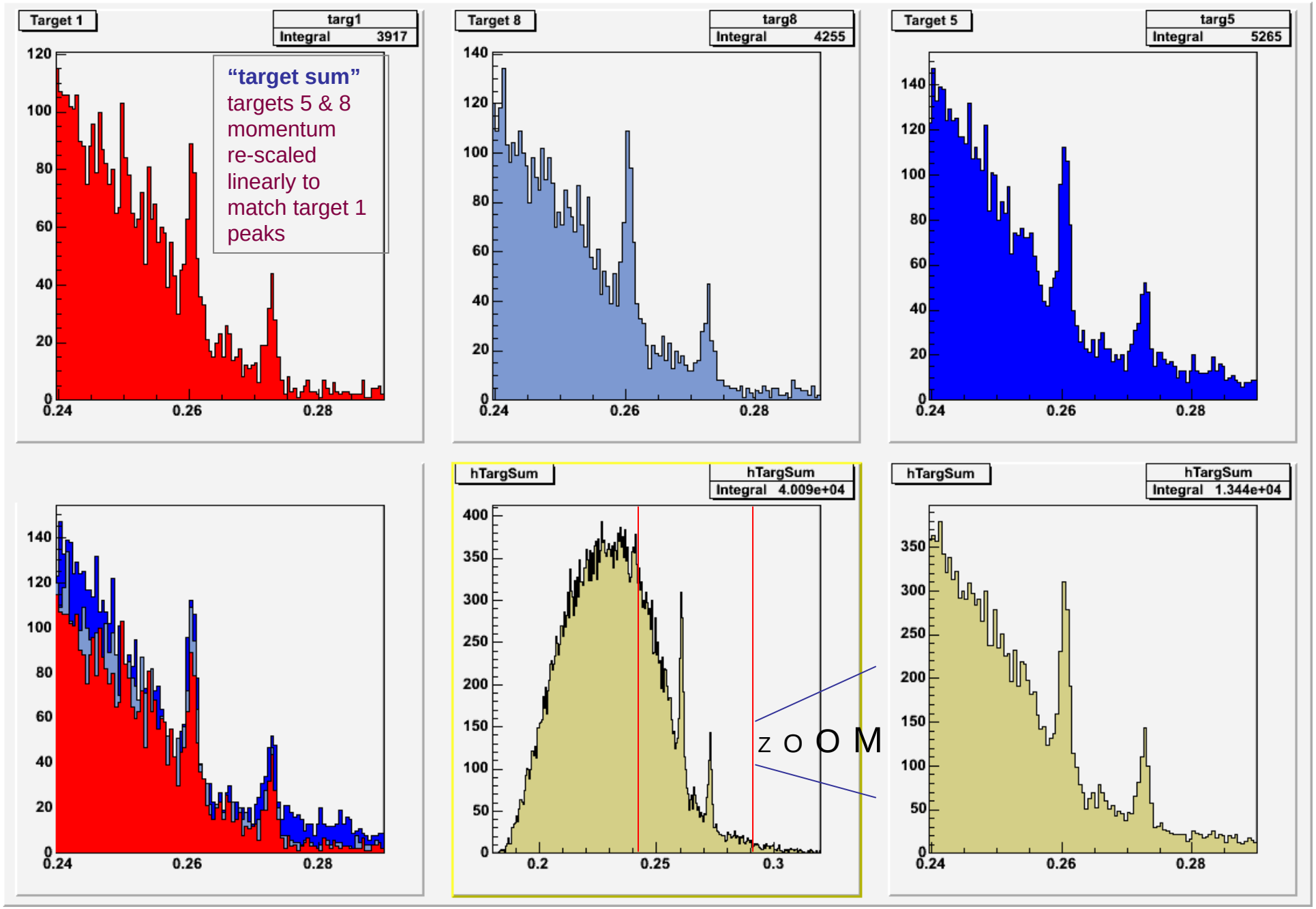
targets sum

$\pi^- \, {}^{12}_{\Lambda}C$ momentum distributions



re-scaled targets sum

$\pi^- \, {}^{12}_{\Lambda}C$ momentum distributions



$$N_{\pi^-} = N_{K^-} \times \varepsilon_{\pi^-} \times R$$

$$N_{\mu^+} = N_{K^+} \times \varepsilon_{\mu^+} \times BR \times \alpha_T$$

$$\Rightarrow R = \frac{N_{K^+} \times N_{\pi^-}}{N_{K^-} \times N_{\mu^+}} \times \frac{\varepsilon_{\mu^+} \times BR \times \alpha_T}{\varepsilon_{\pi^-}}$$

MC

N_{π^-}, N_{K^-}, N_{μ^+}, N_{K^+}	number of ..
ε_{π^-}, ε_{μ^+}	efficiencies
$BR \times \alpha_T$	μ^+ branching ratio (trigger time window corrected)
R	capture rate

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DATI REALI: TUTTA LA STATISTICA
_____________________________________________
Tagli usati per i Mu+: Extrplu==1
############## K+, Mu+ #################
Bersaglio #1: K+ 104735 Mu+ 19878 (18.98%)
Bersaglio #2: K+ 146091 Mu+ 27337 (18.71%)
Bersaglio #3: K+ 155513 Mu+ 29339 (18.87%)
Bersaglio #4: K+ 101850 Mu+ 19088 (18.74%)
Bersaglio #5: K+ 188067 Mu+ 38374 (20.40%)
Bersaglio #6: K+ 201671 Mu+ 38856 (19.27%)
Bersaglio #7: K+ 148735 Mu+ 27325 (18.37%)
Bersaglio #8: K+ 115784 Mu+ 21724 (18.76%)
Totale: K- 1117871
Totale: K+ 1162446, Mu+ 221921 (19.09%)

Tagli usati per i Mu+: Extrplu==1&&Normplu<90
############## K+, Mu+ #################
Bersaglio #1: K+ 104735 Mu+ 10292 (9.83%)
Bersaglio #2: K+ 146091 Mu+ 13665 (9.35%)
Bersaglio #3: K+ 155513 Mu+ 13525 (8.70%)
Bersaglio #4: K+ 101850 Mu+ 8522 (8.37%)
Bersaglio #5: K+ 188067 Mu+ 22988 (12.22%)
Bersaglio #6: K+ 201671 Mu+ 26372 (13.08%)
Bersaglio #7: K+ 148735 Mu+ 17540 (11.79%)
Bersaglio #8: K+ 115784 Mu+ 13419 (11.59%)
Totale: K- 1117871
Totale: K+ 1162446, Mu+ 126323 (10.87%)

Tagli usati per i Mu+: Extrplu==1&&Normplu<60
############## K+, Mu+ #################
Bersaglio #1: K+ 104735 Mu+ 8568 (8.18%)
Bersaglio #2: K+ 146091 Mu+ 8458 (5.79%)
Bersaglio #3: K+ 155513 Mu+ 7937 (5.10%)
Bersaglio #4: K+ 101850 Mu+ 5975 (5.87%)
Bersaglio #5: K+ 188067 Mu+ 16191 (8.61%)
Bersaglio #6: K+ 201671 Mu+ 17981 (8.92%)
Bersaglio #7: K+ 148735 Mu+ 13066 (8.78%)
Bersaglio #8: K+ 115784 Mu+ 9156 (7.91%)
Totale: K- 1117871
Totale: K+ 1162446, Mu+ 87332 (7.51%)
```

Results: real data all statistics

$$R = \frac{N_{K^+} \times N_{\pi^-}}{N_{K^-} \times N_{\mu^+}} \times \frac{\varepsilon_{\mu^+} \times BR \times \alpha_T}{\varepsilon_{\pi^-}}$$

```
Tagli "Best"
Tagli usati per i Mu+ e pi-:
Extrplu==1&&Sterplu<300&&Resdplu<0.15&&Normplu<60

############## K- ###################
Bersaglio #1: K- 1279936 pi- G2 182 G1 110 (1.65)
Bersaglio #2: K- 1767643
Bersaglio #3: K- 1833094
Bersaglio #4: K- 1237776
Bersaglio #5: K- 2132658 pi- G2 262 G1 156 (1.67)
Bersaglio #6: K- 1920485
Bersaglio #7: K- 1430124
Bersaglio #8: K- 1036102 pi- G2 223 G1 119 (1.87)
############## K+, Mu+ #################
Bersaglio #1: K+ 1191386 Mu+ 21716 (1.82%)
Bersaglio #2: K+ 1653264 Mu+ 15704 (0.95%)
Bersaglio #3: K+ 1753050 Mu+ 33985 (1.94%)
Bersaglio #4: K+ 1111017 Mu+ 24463 (2.20%)
Bersaglio #5: K+ 2070744 Mu+ 63942 (3.09%)
Bersaglio #6: K+ 2266899 Mu+ 76381 (3.37%)
Bersaglio #7: K+ 1717039 Mu+ 55025 (3.20%)
Bersaglio #8: K+ 1301223 Mu+ 33201 (2.55%)

Totale: K- 12637818
Totale: K+ 13064622, Mu+ 324417 (2.48%)
```

$$R_1 = \frac{110}{21716} \cdot \frac{1191386}{1279936} \cdot \frac{20,0}{28,3} = 3,3 \times 10^{-3}$$

$$R_5 = \frac{156}{63942} \cdot \frac{2070744}{2132658} \cdot \frac{21,5}{28,3} = 1,8 \times 10^{-3}$$

$$R_8 = \frac{119}{33201} \cdot \frac{1301223}{1036102} \cdot \frac{18,5}{28,3} = 2,9 \times 10^{-3}$$

```
Tagli "Loose"
Tagli usati per i Mu+ e pi-:
Extrplu==1&&Sterplu<2000&&Resdplu<0.5&&
Normplu<80&&Dev2plu<100&&abs(Lamplu)<50
############## K- ###################
Bersaglio #1: K- 1279936 pi- G2 253 G1 156 (1.62)
Bersaglio #2: K- 1767643
Bersaglio #3: K- 1833094
Bersaglio #4: K- 1237776
Bersaglio #5: K- 2132658 pi- G2 500 G1 309 (1.62)
Bersaglio #6: K- 1920485
Bersaglio #7: K- 1430124
Bersaglio #8: K- 1036102 pi- G2 322 G1 192 (1.68)
############## K+, Mu+ #################
Bersaglio #1: K+ 1191386 Mu+ 41901  (3.52%)
Bersaglio #2: K+ 1653264 Mu+ 46302  (2.80%)
Bersaglio #3: K+ 1753050 Mu+ 64111  (3.66%)
Bersaglio #4: K+ 1111017 Mu+ 43996  (3.96%)
Bersaglio #5: K+ 2070744 Mu+ 129318 (6.25%)
Bersaglio #6: K+ 2266899 Mu+ 149580 (6.60%)
Bersaglio #7: K+ 1717039 Mu+ 103844 (6.05%)
Bersaglio #8: K+ 1301223 Mu+ 64712  (4.97%)

Totale: K- 12637818
Totale: K+ 13064622, Mu+ 643764 (4.93%)
```

$$R_1 = \frac{156}{41901} \cdot \frac{1191386}{1279936} \cdot \frac{17,5}{26,2} = 2,3 \times 10^{-3}$$

$$R_5 = \frac{309}{129318} \cdot \frac{2070744}{2132658} \cdot \frac{17,6}{26,2} = 1,6 \times 10^{-3}$$

$$R_8 = \frac{192}{64712} \cdot \frac{1301223}{1036102} \cdot \frac{16,5}{26,2} = 2,3 \times 10^{-3}$$