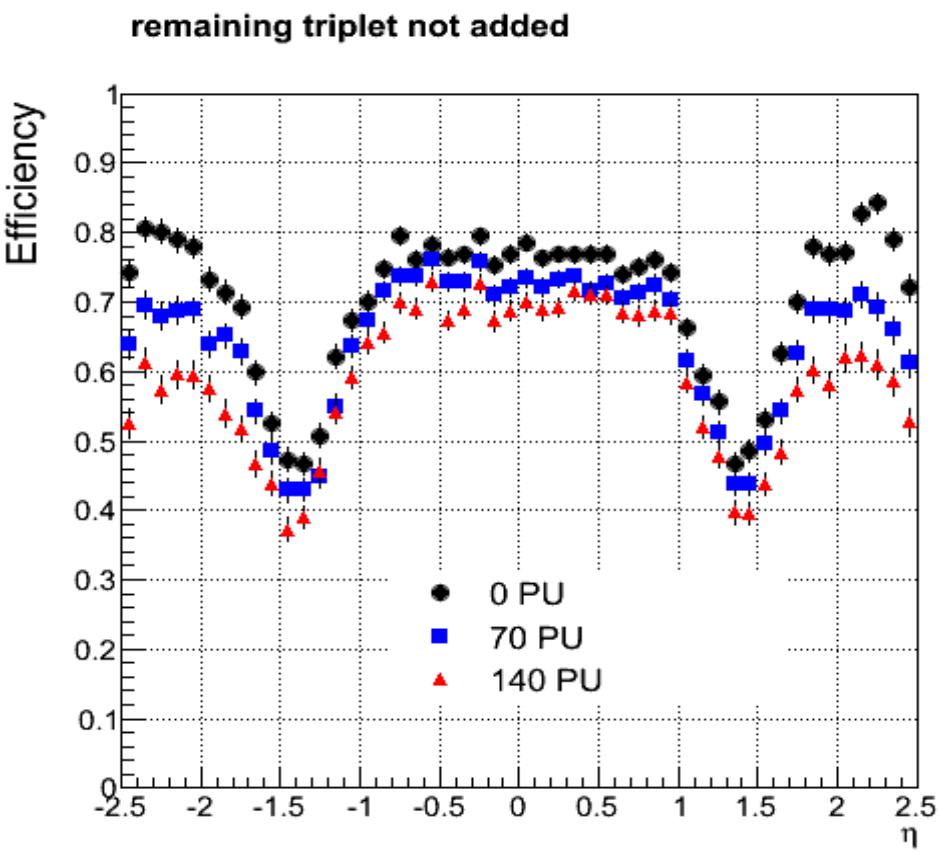
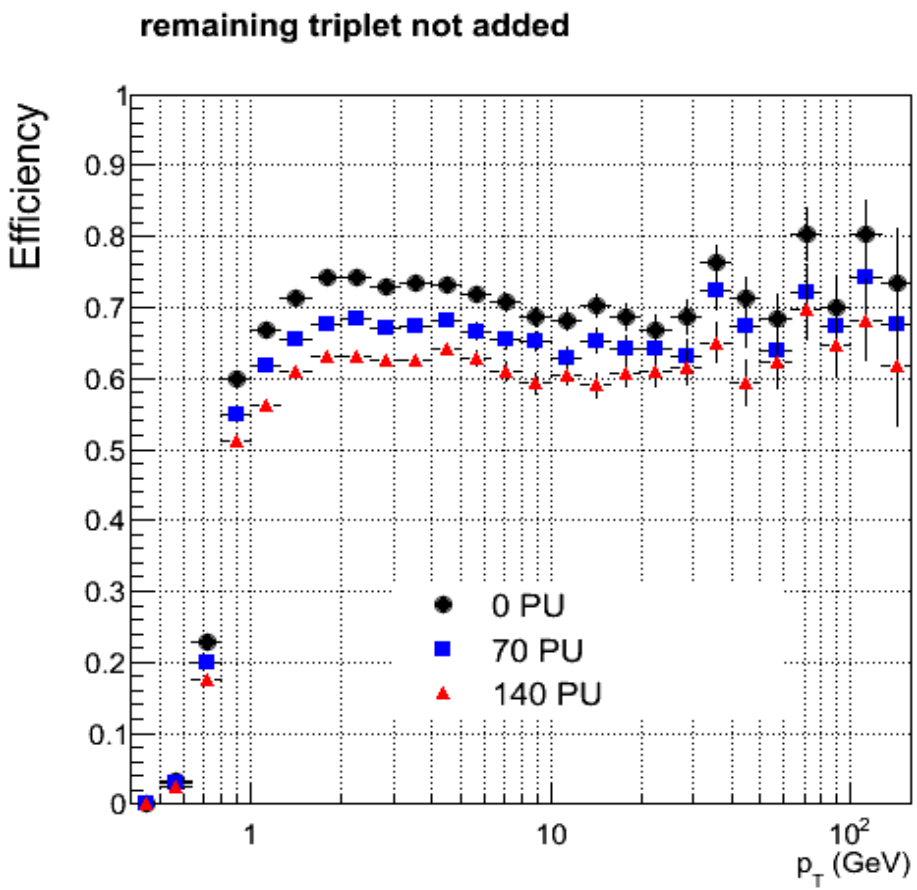
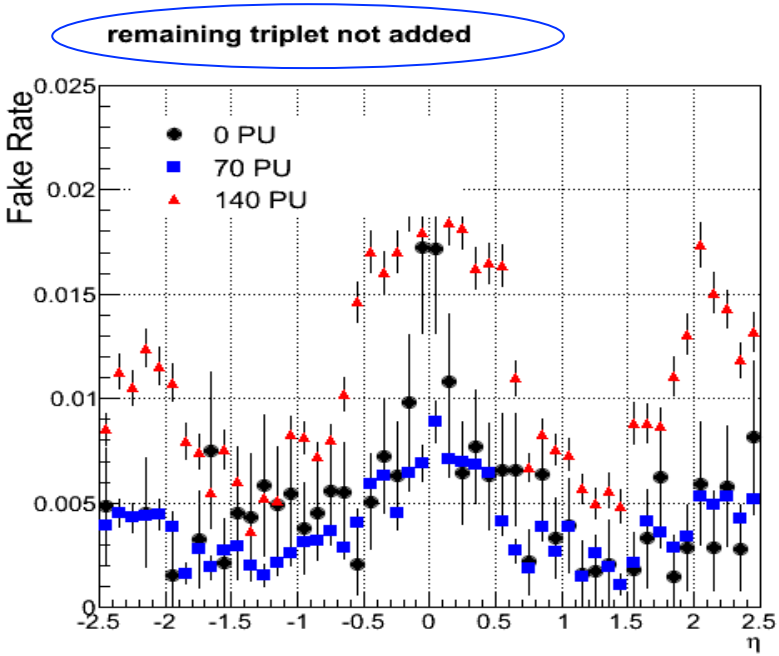
Efficiencies in different PU scenario

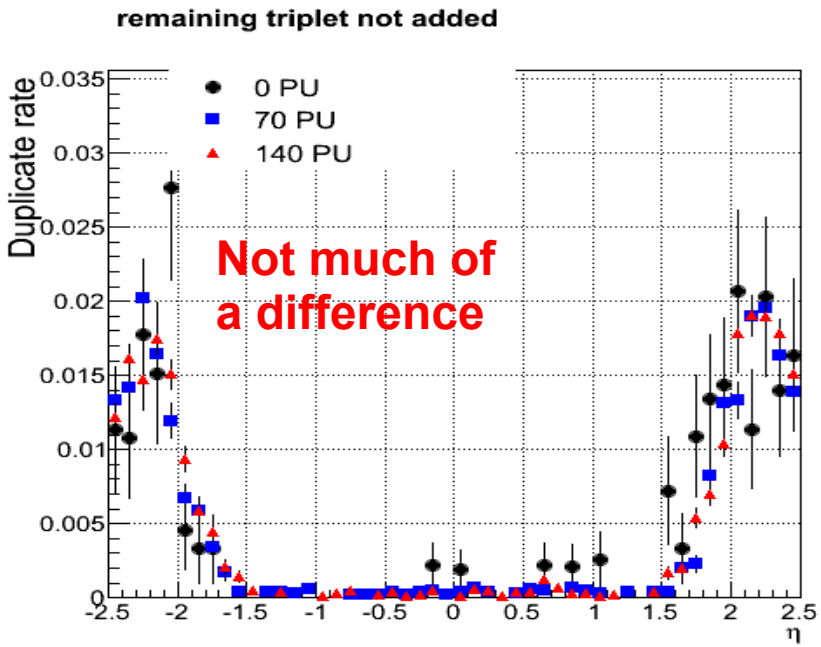


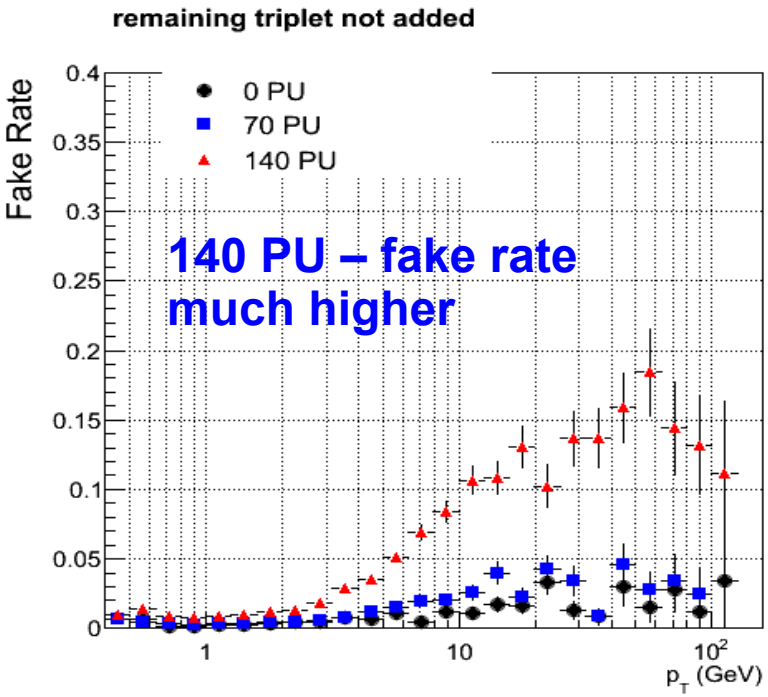


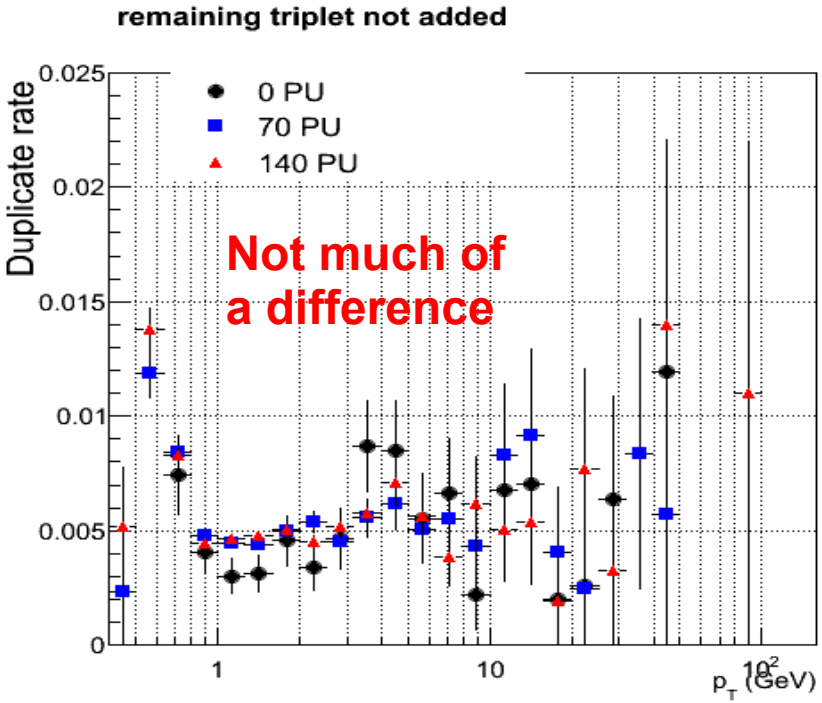
New: Adding all the samples (1000 events) [earlier, could not add – shown less statistics]

Fake Rate, Duplicate Rate in different PU scenario

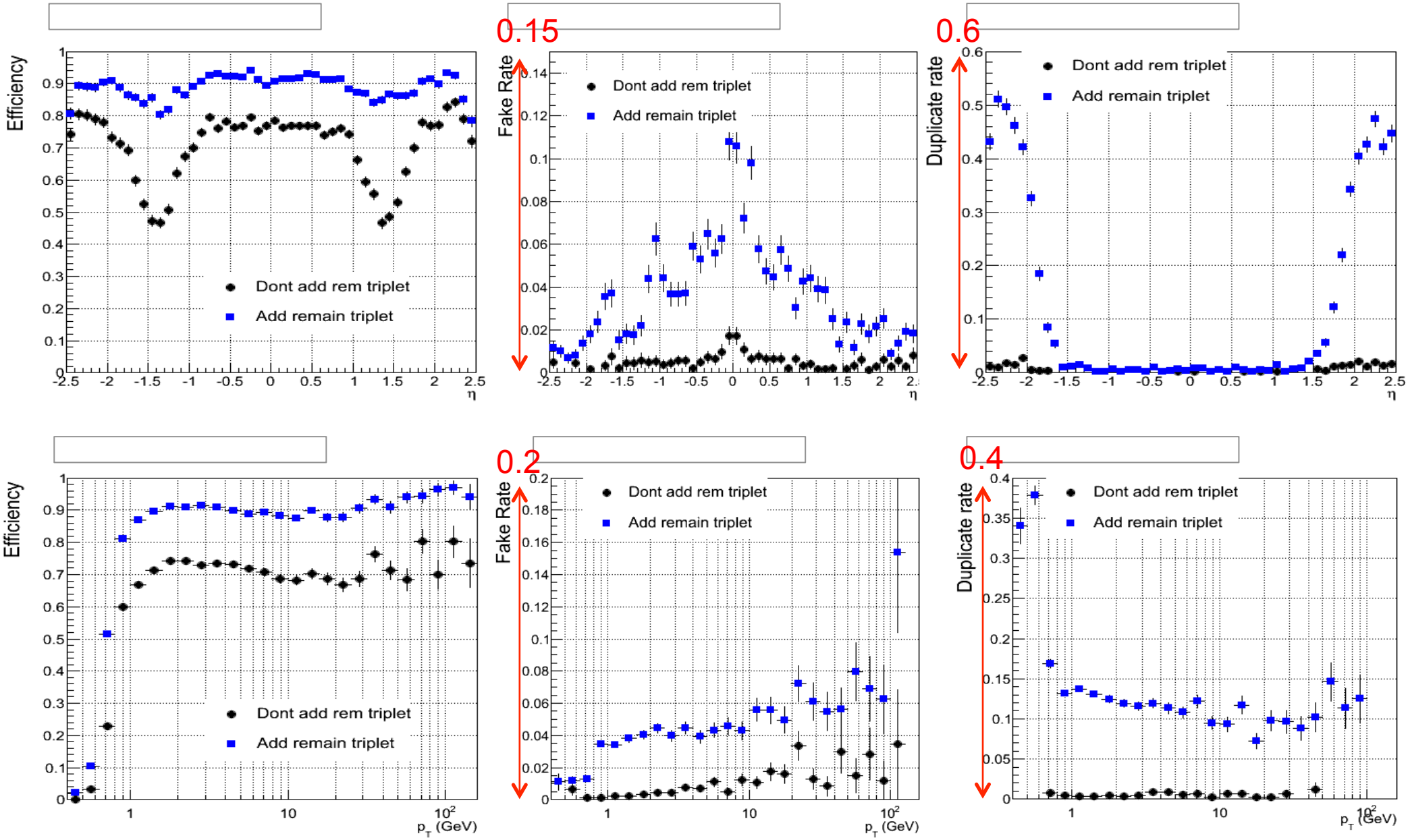




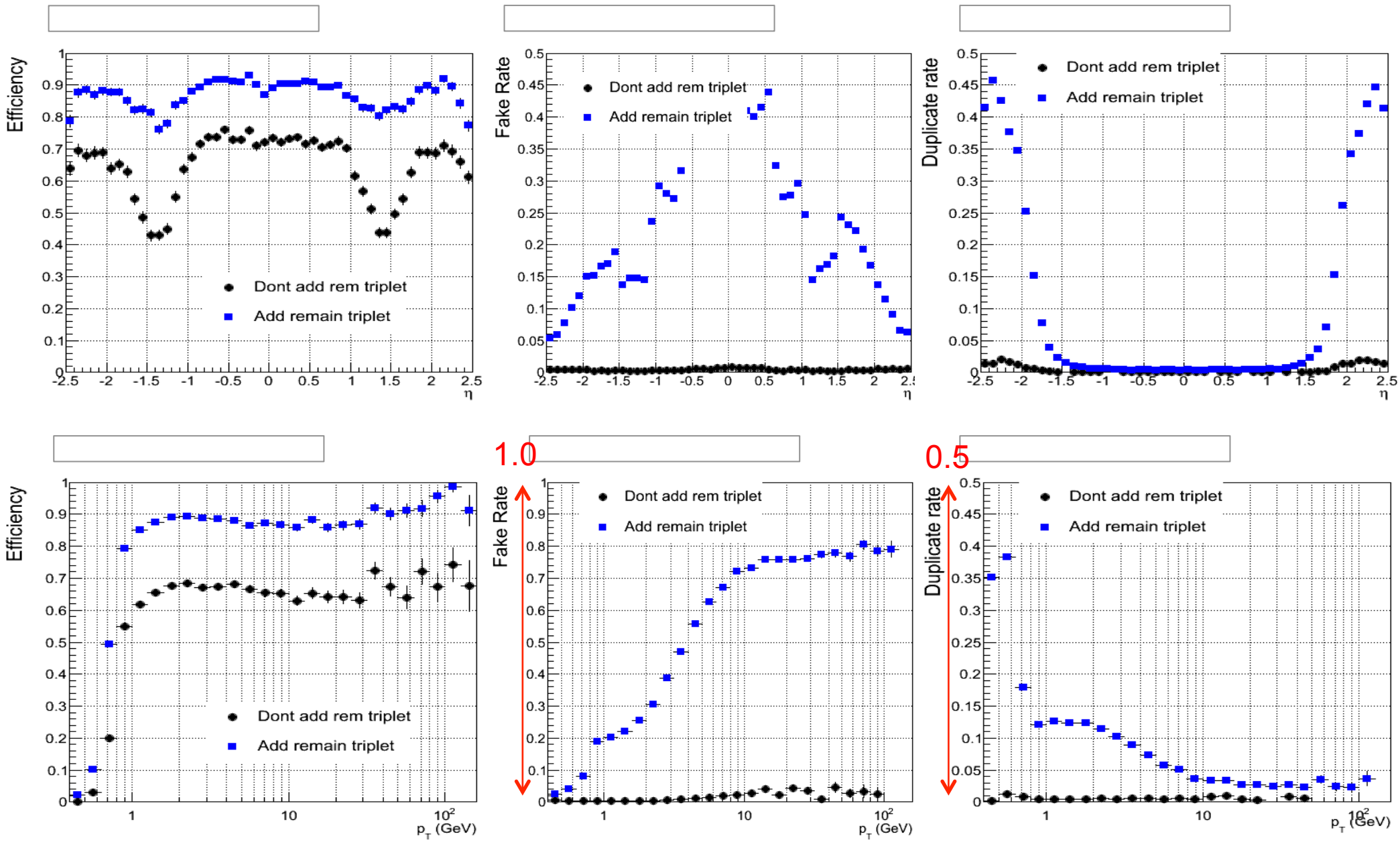




Efficiency, Fake rate, Duplicate rate – 0 PU



Efficiency, Fake rate, Duplicate rate – 70 PU



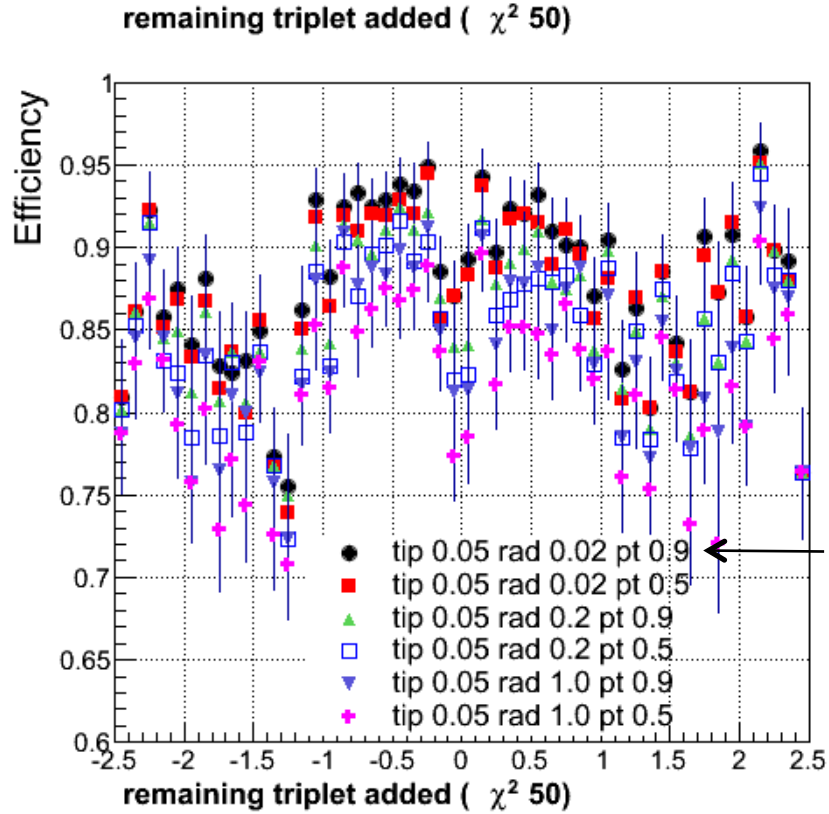
Status

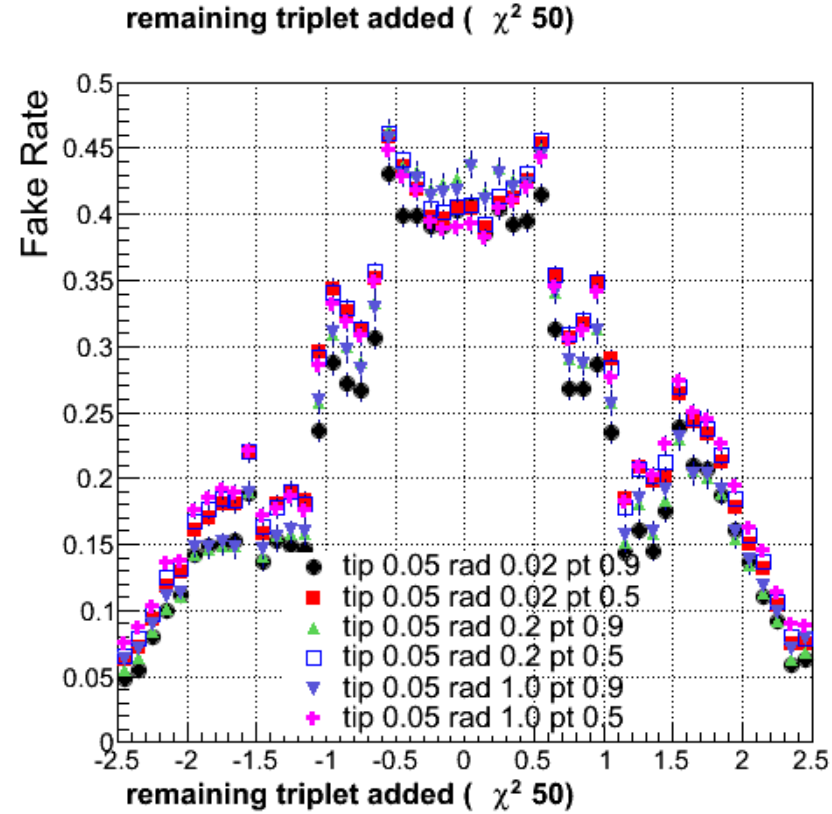
I have studied the high fake rate with adding remaining triplets for the following sets of parameter choices:

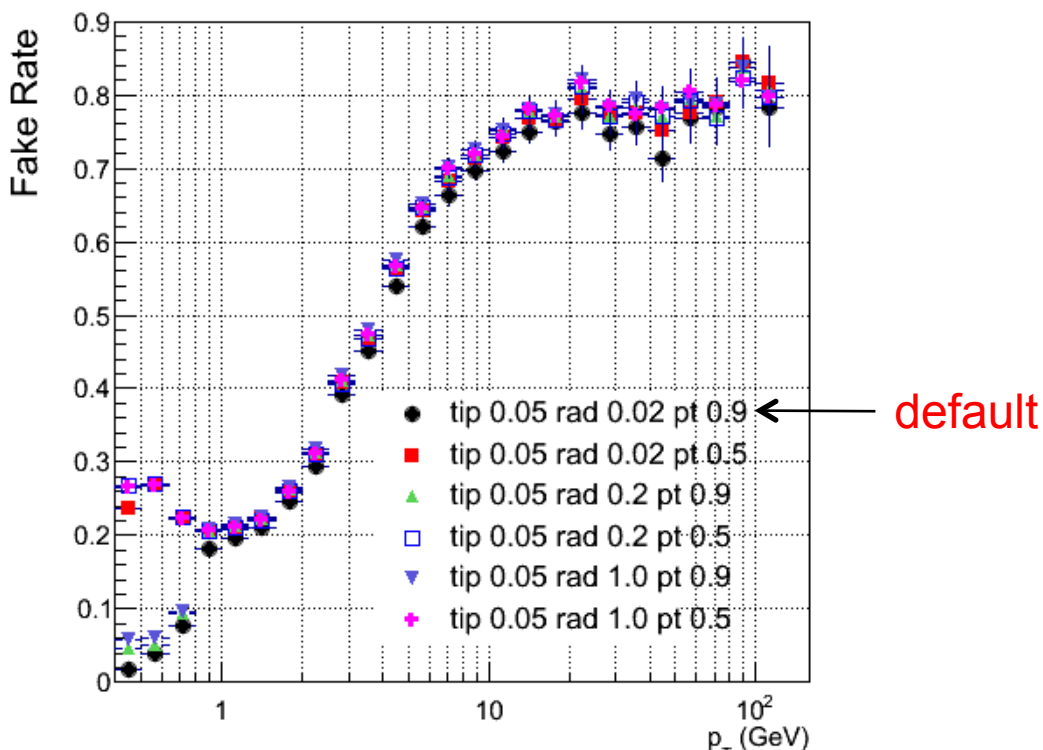
case #	chi2	tipMax	originRadius (cm)	ptMin(pixel)	
default (so far)	50	0.05	0.02	0.9	
# 1	50	0.05	0.02	0.5	
# 2	50	0.05	0.2	0.9	
# 3	50	0.05	0.2	0.5	set1
# 4	50	0.05	1.0	0.9	
# 5	50	0.05	1.0	0.5	
# 6	50	1.0	0.02	0.9	
# 7	50	1.0	0.02	0.5	
# 8	50	1.0	0.2	0.9	
# 9	50	1.0	0.2	0.5	set2
# 10	50	1.0	1.0	0.9	
# 11	50	1.0	1.0	0.5	

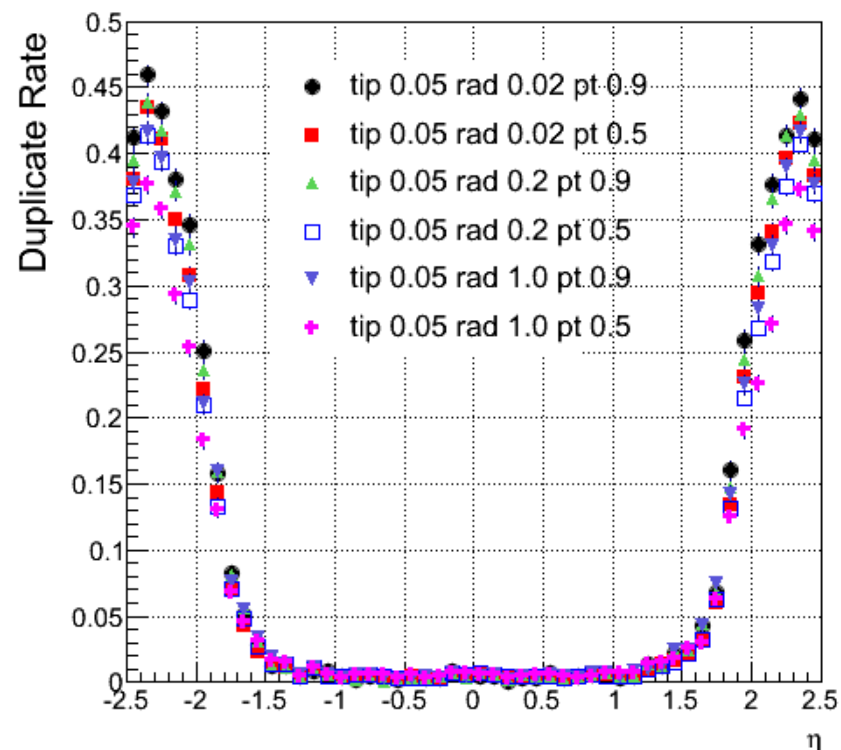
.. I show the results in following slides

set 1

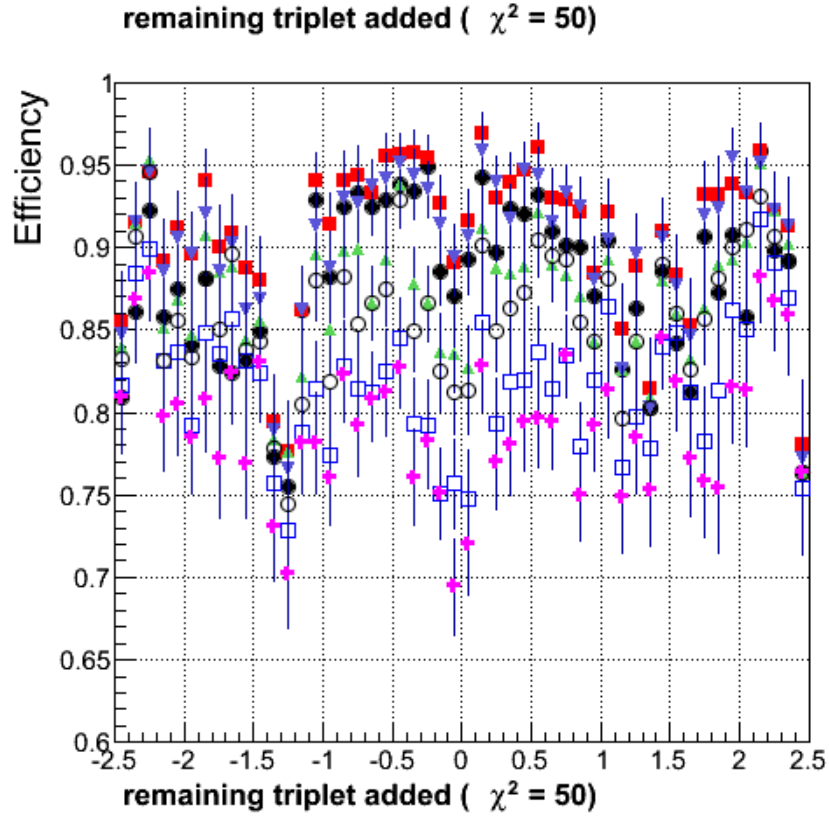

remaining triplet added (χ² 50)
Efficiency
tip 0.05 rad 0.02 pt 0.9
tip 0.05 rad 0.02 pt 0.5
tip 0.05 rad 0.2 pt 0.9
tip 0.05 rad 0.2 pt 0.5
tip 0.05 rad 1.0 pt 0.9
tip 0.05 rad 1.0 pt 0.5
default
remaining triplet added (χ² 50)

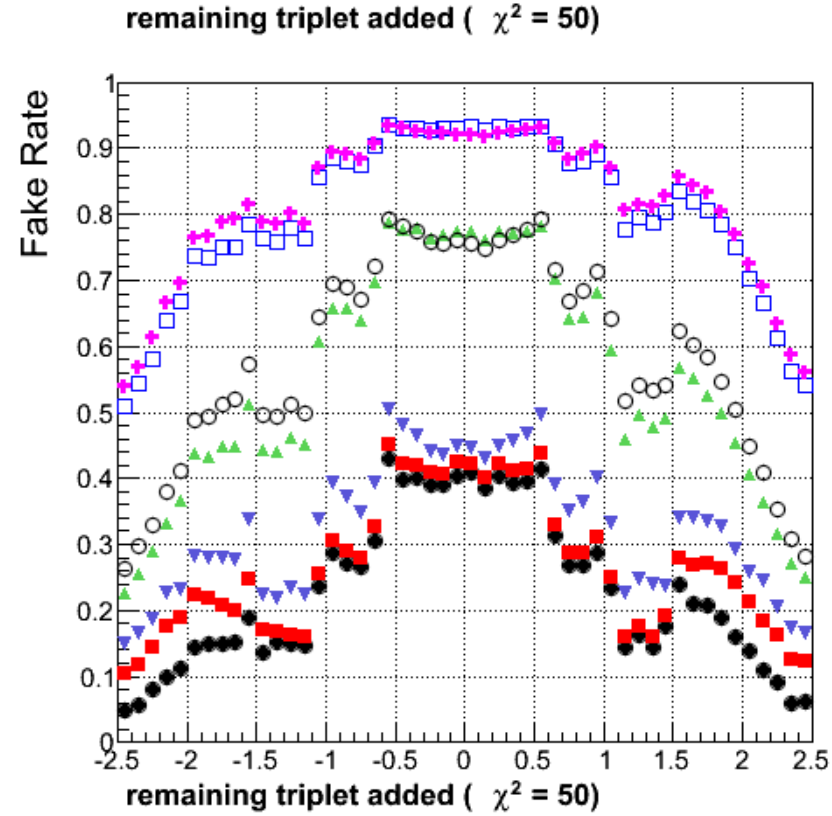

remaining triplet added (χ² 50)
Fake Rate
tip 0.05 rad 0.02 pt 0.9
tip 0.05 rad 0.02 pt 0.5
tip 0.05 rad 0.2 pt 0.9
tip 0.05 rad 0.2 pt 0.5
tip 0.05 rad 1.0 pt 0.9
tip 0.05 rad 1.0 pt 0.5
remaining triplet added (χ² 50)

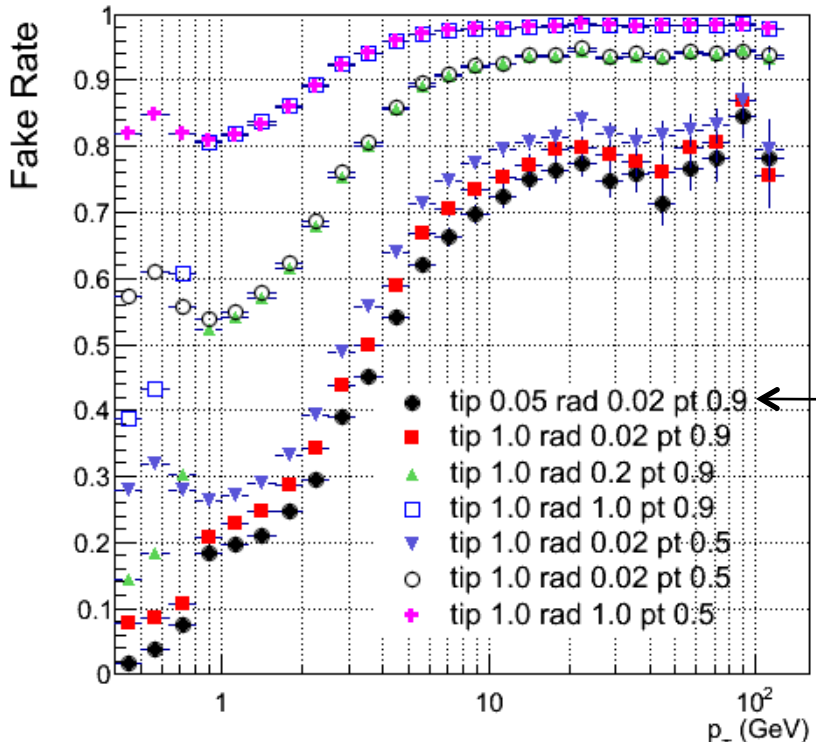

Fake Rate
tip 0.05 rad 0.02 pt 0.9
tip 0.05 rad 0.02 pt 0.5
tip 0.05 rad 0.2 pt 0.9
tip 0.05 rad 0.2 pt 0.5
tip 0.05 rad 1.0 pt 0.9
tip 0.05 rad 1.0 pt 0.5
default
p_ (GeV)


Duplicate Rate
tip 0.05 rad 0.02 pt 0.9
tip 0.05 rad 0.02 pt 0.5
tip 0.05 rad 0.2 pt 0.9
tip 0.05 rad 0.2 pt 0.5
tip 0.05 rad 1.0 pt 0.9
tip 0.05 rad 1.0 pt 0.5
η

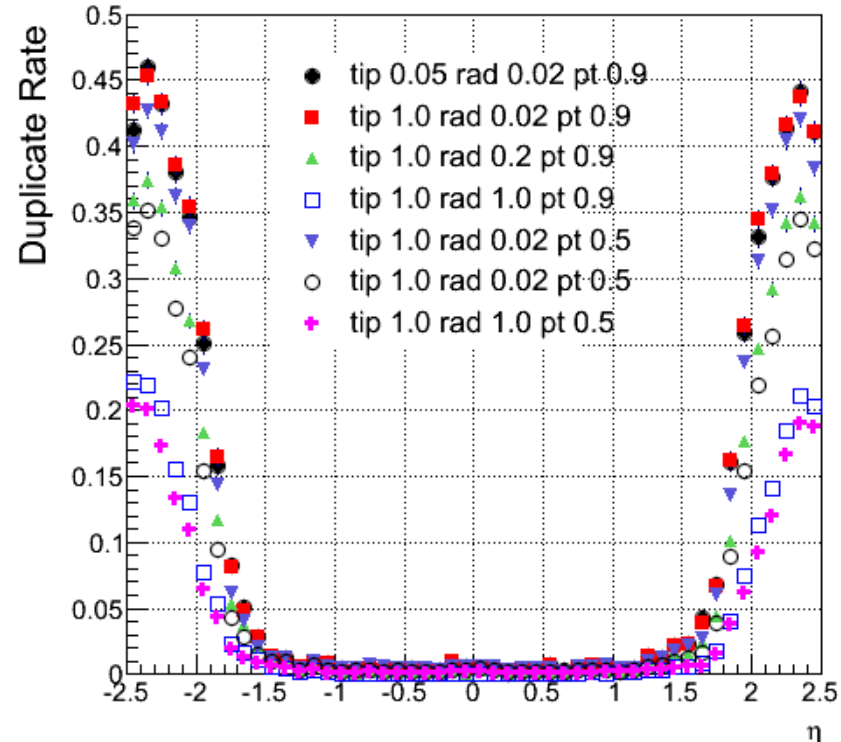
set 2







default



❑ I kept the default set of parameters in both these sets of plots marking them with the solid black circles. (for comparison to the modified cases)

case #	chi2	tipMax	originRadius	ptMin
default	50	0.05	0.02	0.9
# 1	50	0.05	0.02	0.5
# 2	50	0.05	0.2	0.9
# 3	50	0.05	0.2	0.5
# 4	50	0.05	1.0	0.9
# 5	50	0.05	1.0	0.5
# 6	50	1.0	0.02	0.9
# 7	50	1.0	0.02	0.5
# 8	50	1.0	0.2	0.9
# 9	50	1.0	0.2	0.5
# 10	50	1.0	1.0	0.9
# 11	50	1.0	1.0	0.5

Observation form set 1:
with tipMax=0.05 (as kept in default – we don't see much changes changing the rest, except fake rate at low pt (0.5-0.9) does get higher for the sets with pt cut at 0.5.

We do not get better fake rate changing the other parameter values.

Observation from set 2:
With tipMax at 1.0 – the current default values give the best fake rate.
Any suggestions?

Inference: Changing the parameter values do not necessarily give us a handle.
Next steps:
- Modifying the code to allow tighter cuts on the triplets than on the quadruplets.
- Or allow triplets only in regions where we are not guaranteed four hits (1<|eta|<1.5).