

## Old MC set summary

MC set	RNuc
(XnXn) minbias w/o interference	6.35 fm
(XnXn) minbias w/ interference	6.8 fm
topology w/o interference	7.55 fm
topology w/ interference	8.0 fm

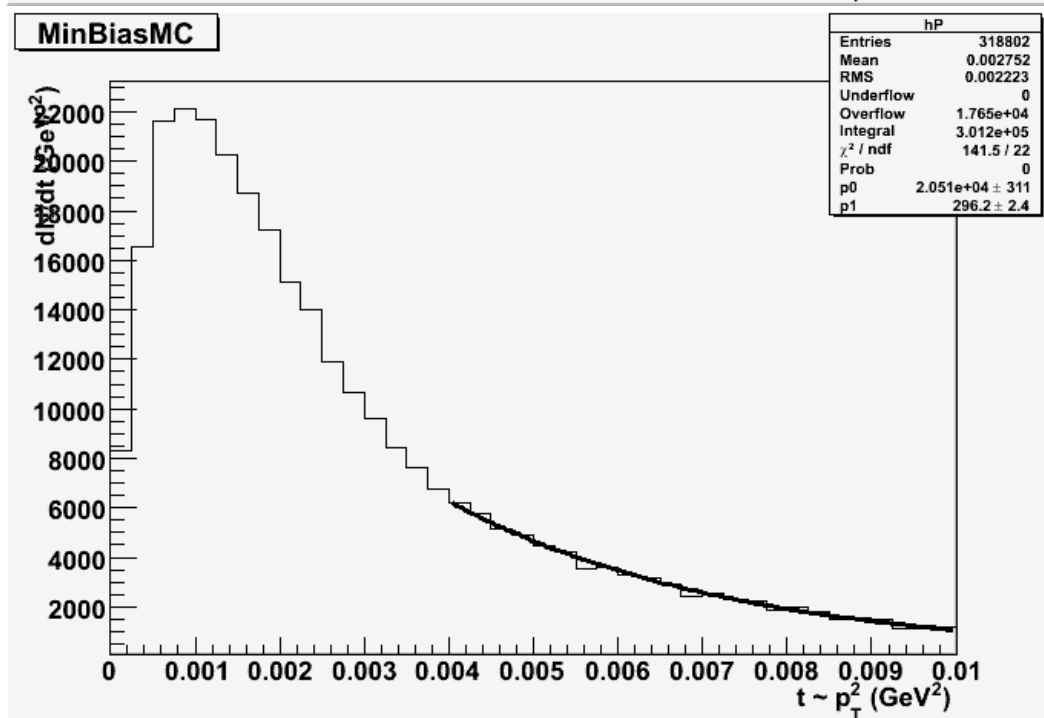
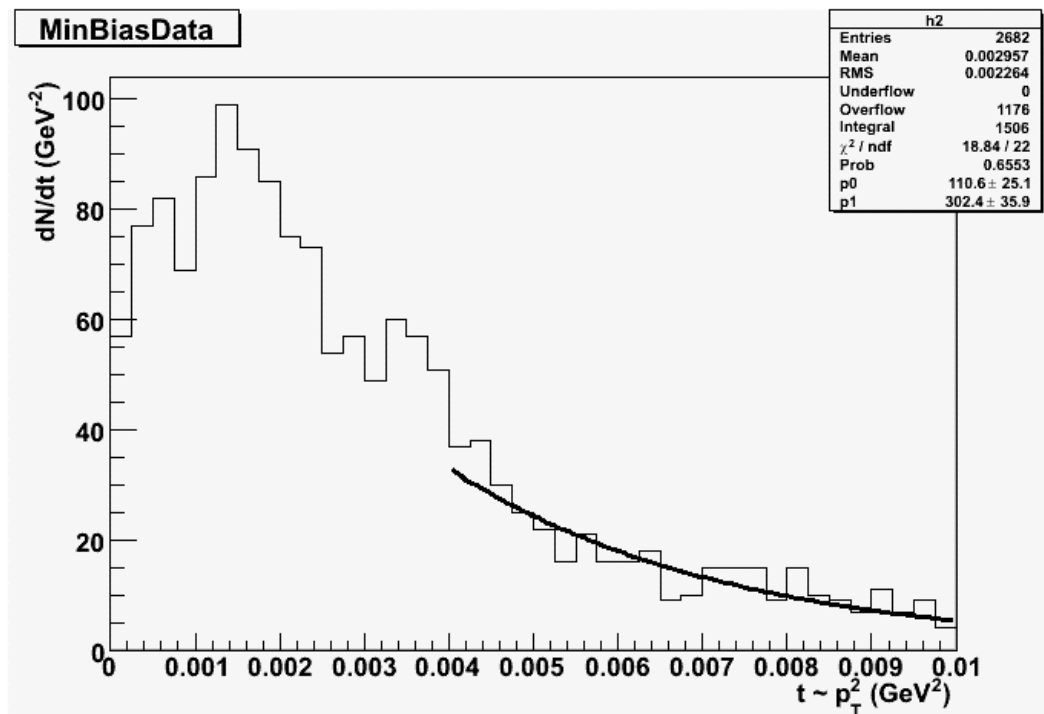
## New MC set summary

MC set	RNuc
(XnXn) UPC minbias with and without interference	6.8 fm
UPC topology with and without interference	8.0 fm

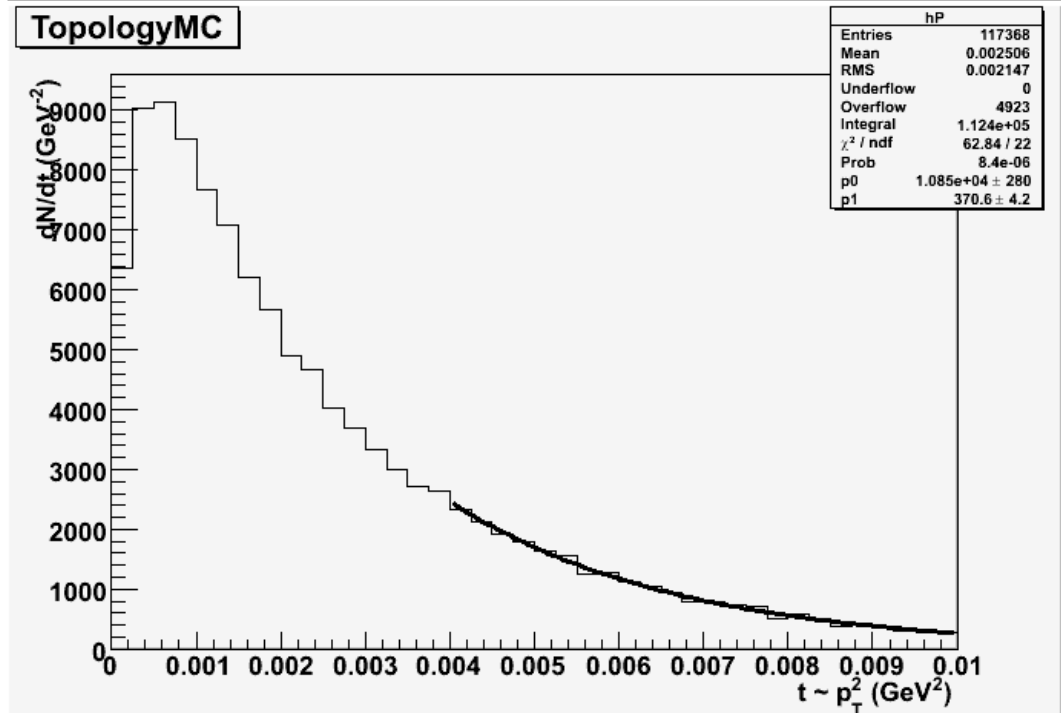
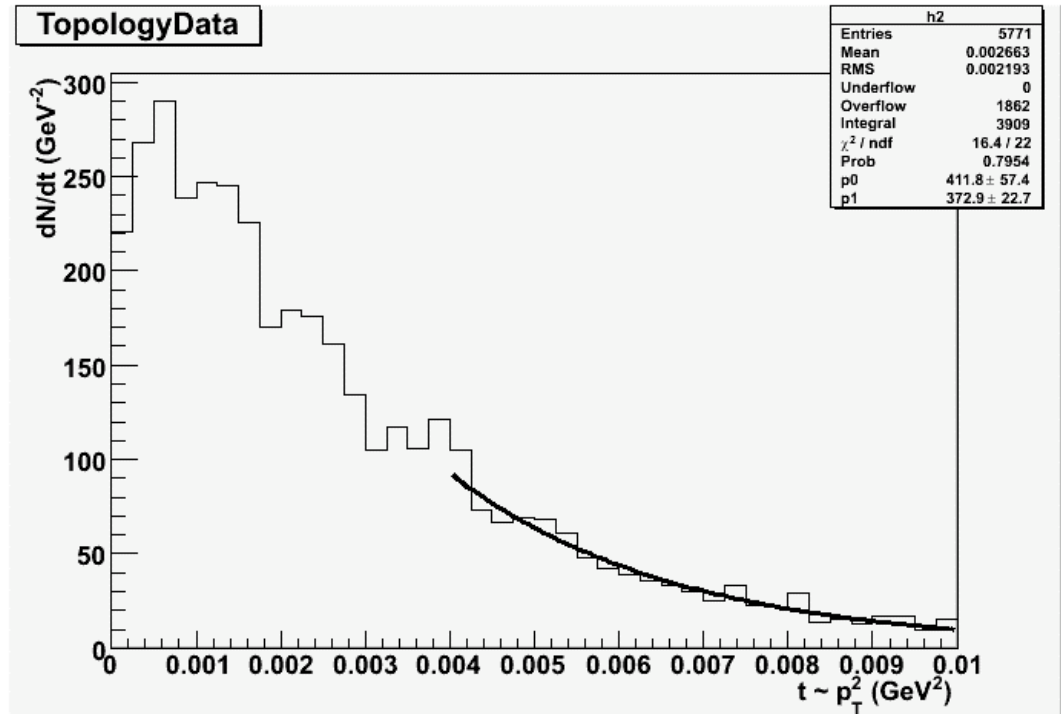
## Monte Carlo set comparison

- 400k events generated for each set in STARlight
- Radius adjusted for matching exponential slope of t-spectrum
- Fully reconstructed (raw output run through same processes as data to account for detector effects)
- 'Old' MC Set - radius matched to exponential slope for both MC sets (with and without interference)
- 'New' MC Set - same radius for both sets

- 400k events generated for MinBias (XnXn) MC set in STARlight
- Radius adjusted for matching exponential slope of t-spectrum
- fit function =  $Ae^{-k \cdot t}$ 
  - data  $k = 302 \text{ GeV}^{-1}$
  - MC  $k = 296 \text{ GeV}^{-1}$
- fit range:  $0.004 < t < 0.01$

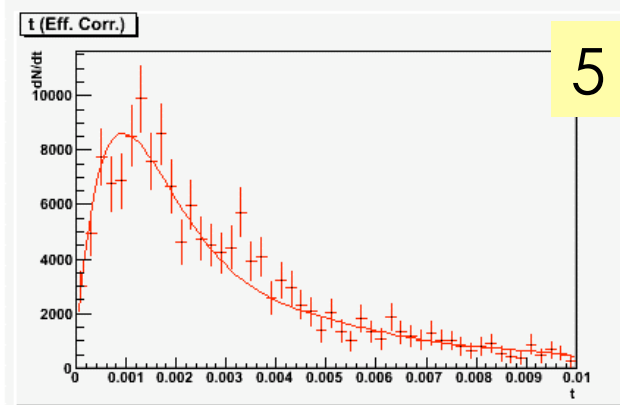
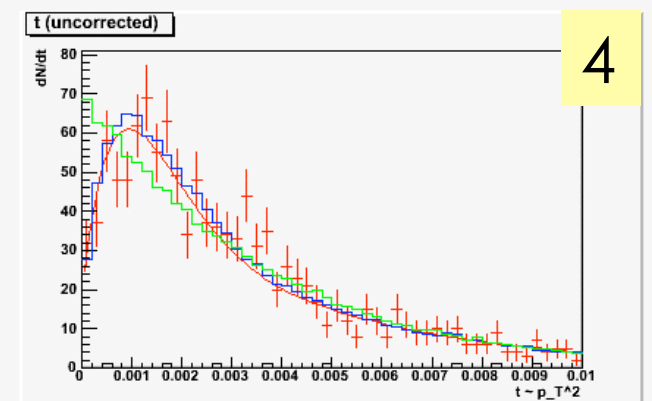
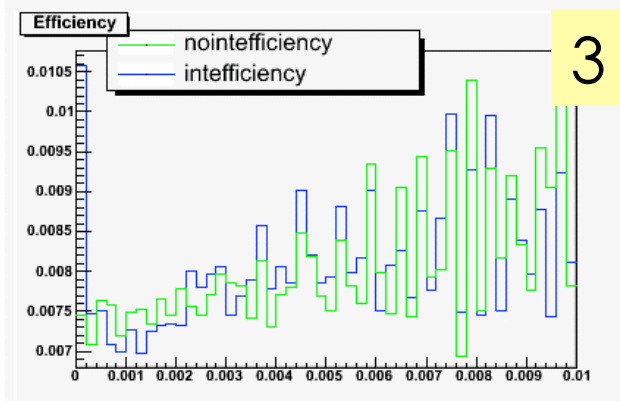
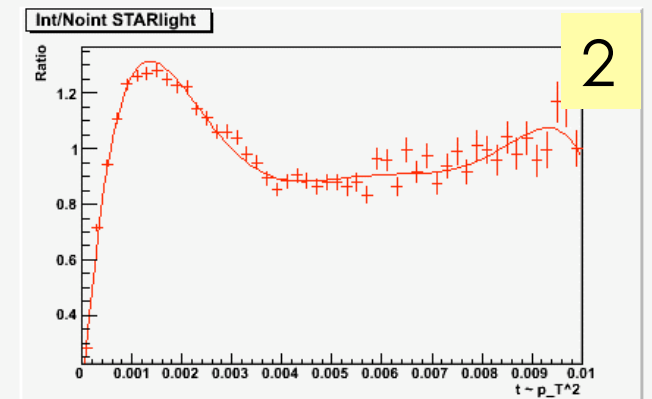
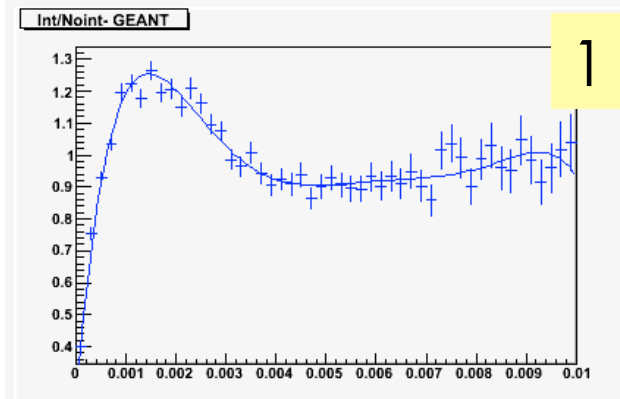


- 400k events generated for topology (0n0n) MC set in STARlight
- Radius adjusted for matching exponential slope of t-spectrum
- fit function =  $Ae^{-k \cdot t}$ 
  - data  $k = 373 \text{ GeV}^{-1}$
  - MC  $k = 371 \text{ GeV}^{-1}$
- fit range:  $0.004 < t < 0.01$



Explanation of plots:

- 1) Ratio of GEANT corrected Monte Carlo (STARlight) interference t-spectrum ( $t \sim p_T^2$ ) to no-interference t-spectrum
- 2) Ratio of uncorrected STARlight interference t-spectrum to no-interference t-spectrum
- 3) Efficiency curves calculated for interference and no-interference scenarios (ratio of MC t-spectrum run through GEANT to t-spectrum not run through GEANT)
- 4) MC interference histogram (blue), MC no-interference histogram (green), uncorrected data (red points), overall parameterization (red curve)
- 5) uncorrected data (red points), overall parameterization (red curve)



Explanation of statistics:

(1) p0 - p6, fit parameters for 6th order polynomial fit to ratio

(2) Same as 1

(4 & 5)

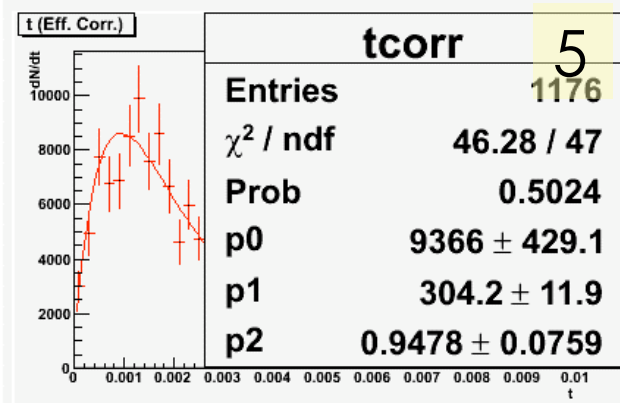
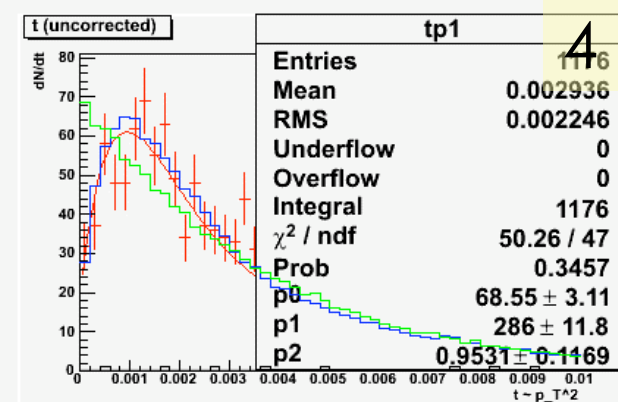
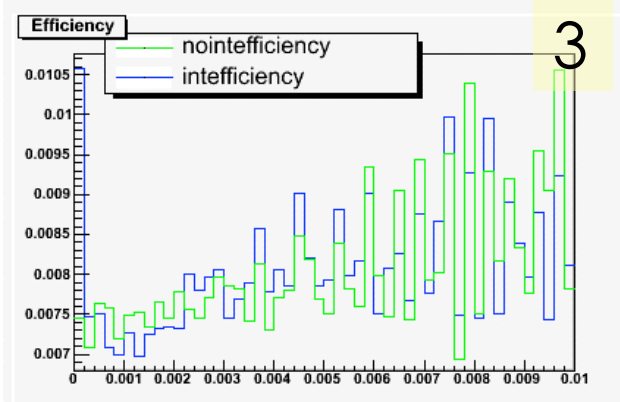
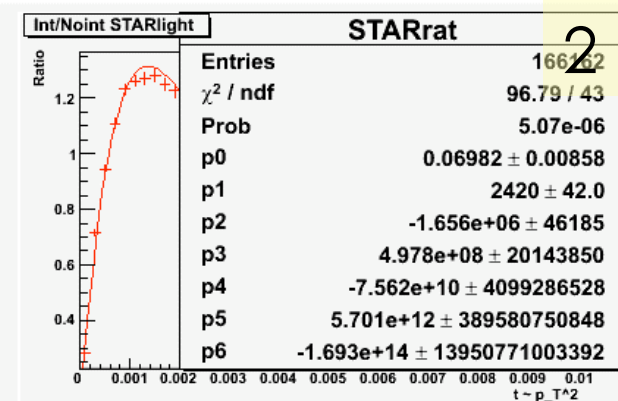
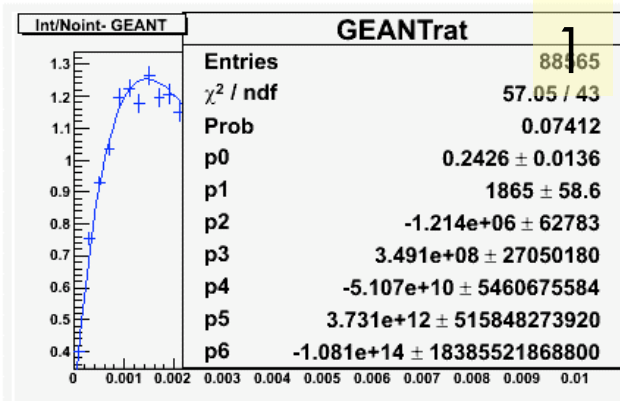
p0 - p2 come from overall fit:

$$\frac{dN}{dt} = Ae^{-kt} (1 + c[R(t) - 1])$$

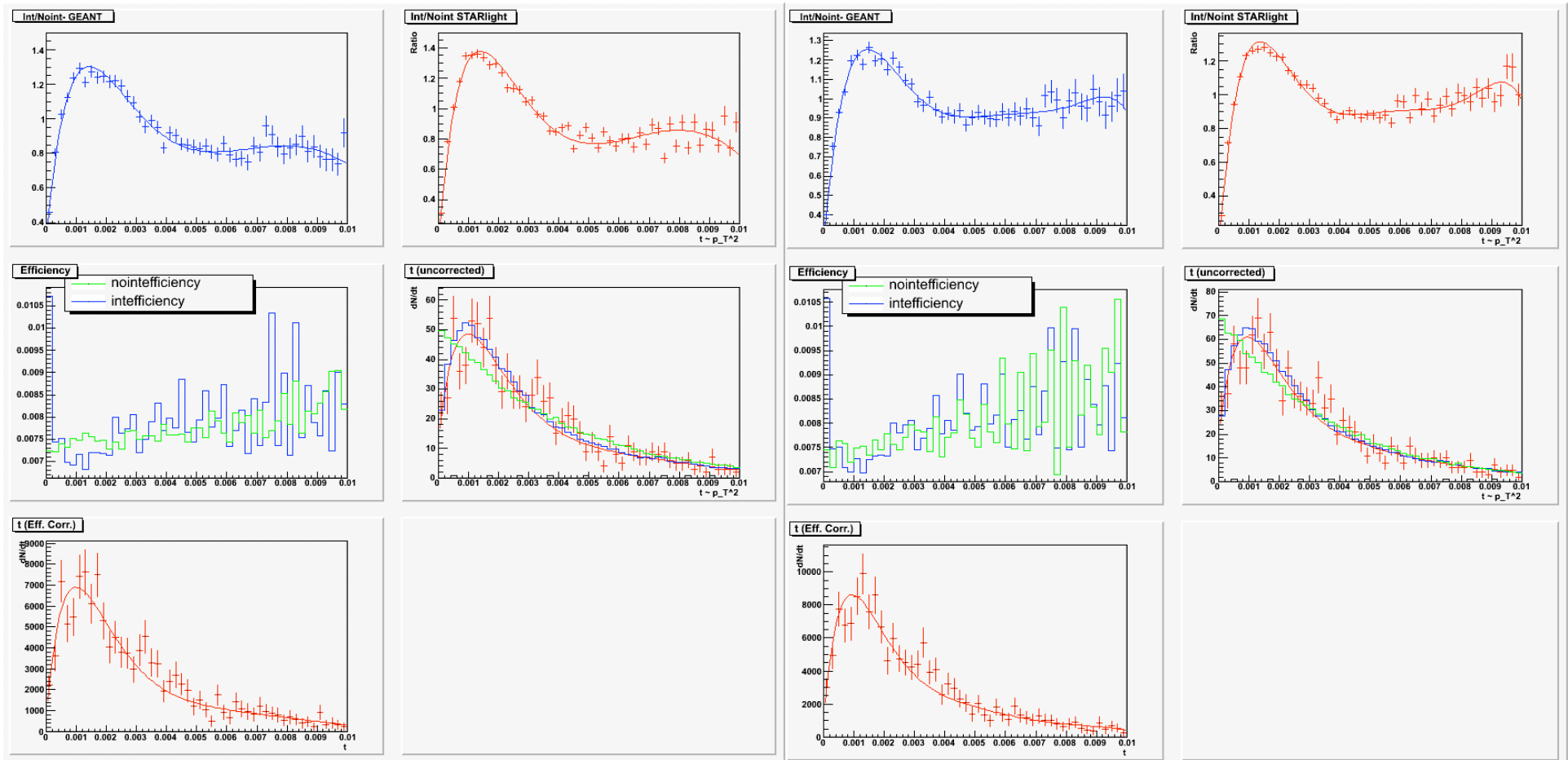
p0 = A

p1 = c

p2 = k

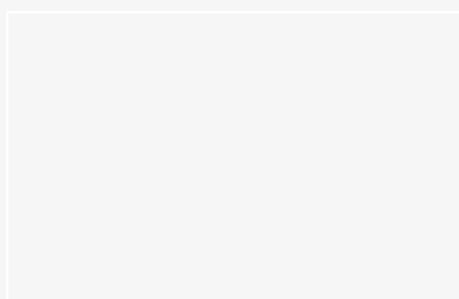
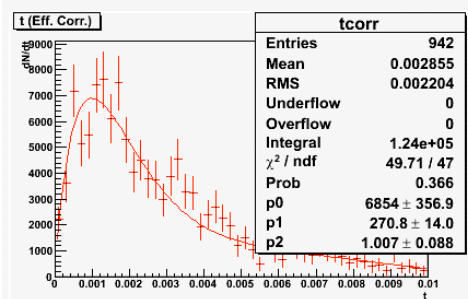
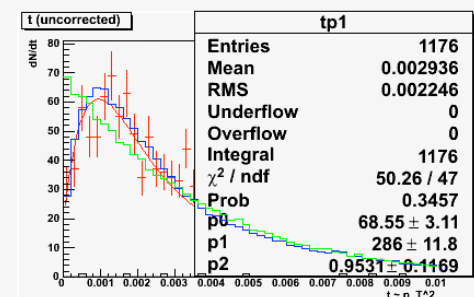
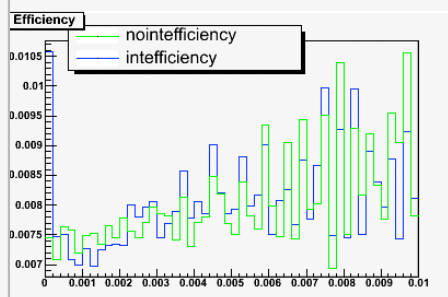
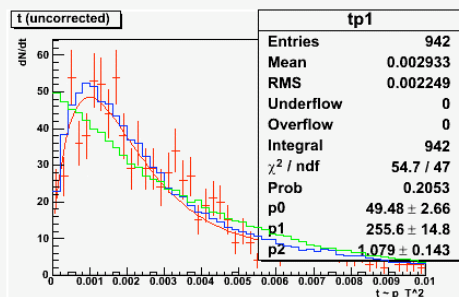
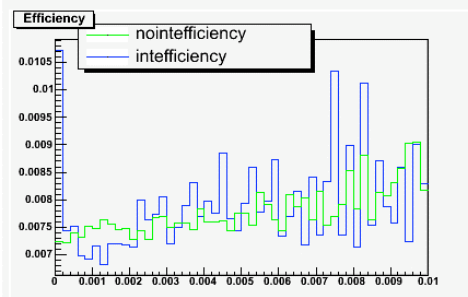
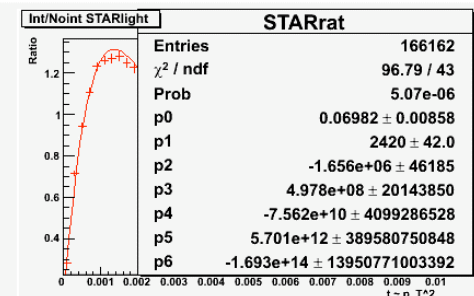
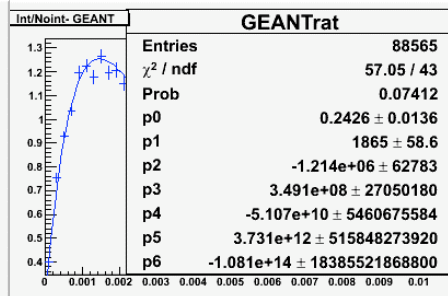
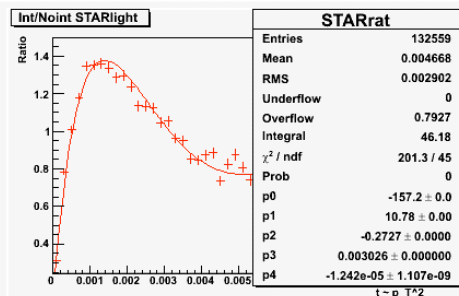
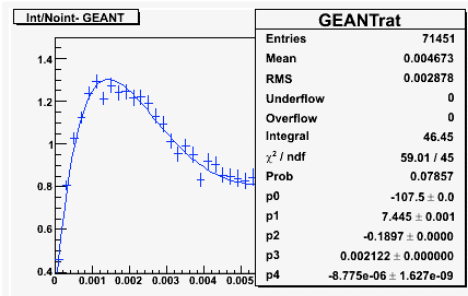


UPC MinBias(with nuclear excitation) or UPC topology(without nuclear excitation) = trigger dataset



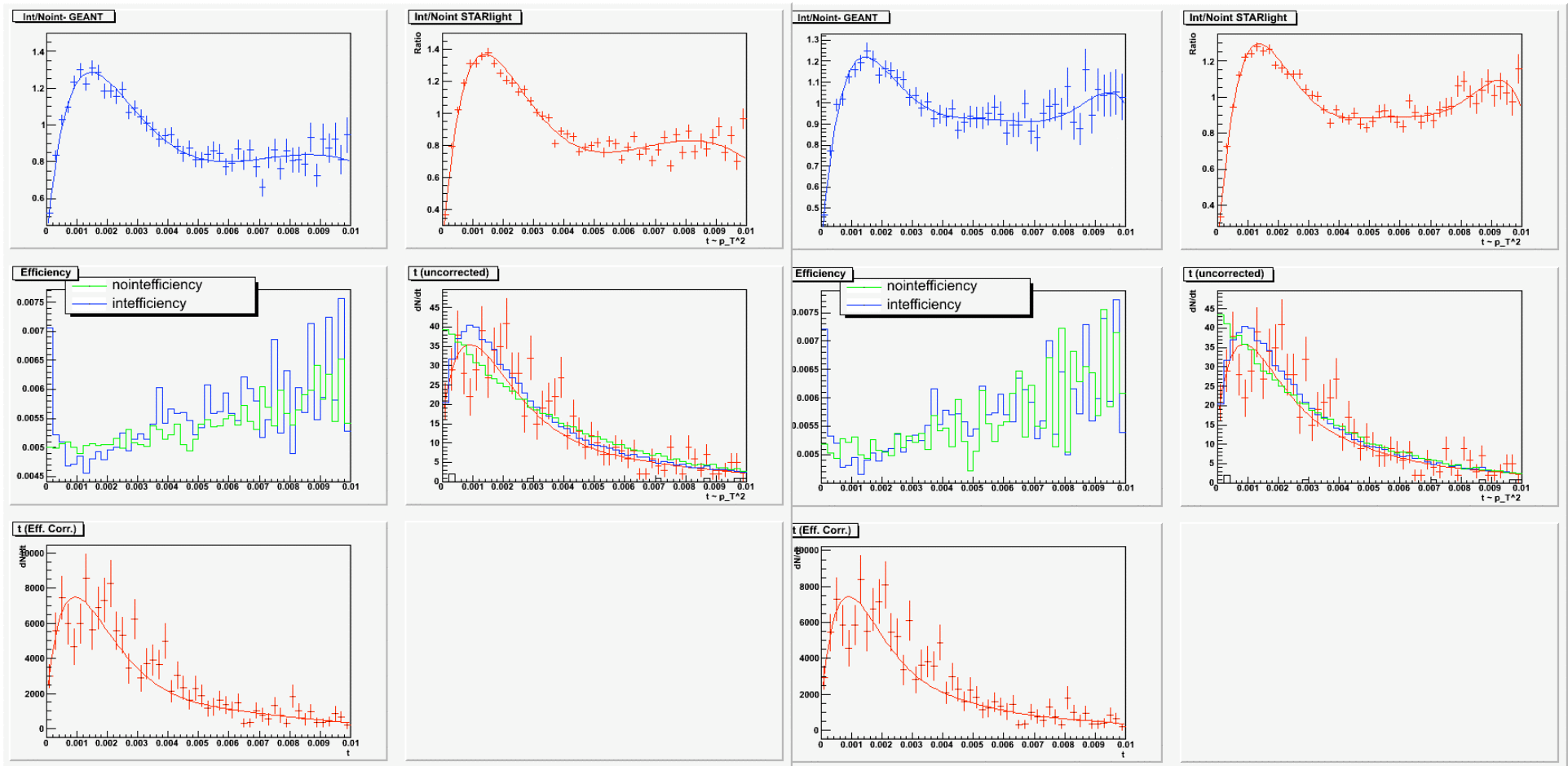
old UPC MinBias  
 $0.1 < y < 0.5$

new UPC MinBias  
 $0.0 < y < 0.5$



old UPC MinBias  
0.1 < y < 0.5

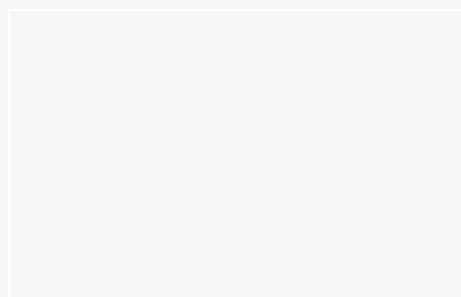
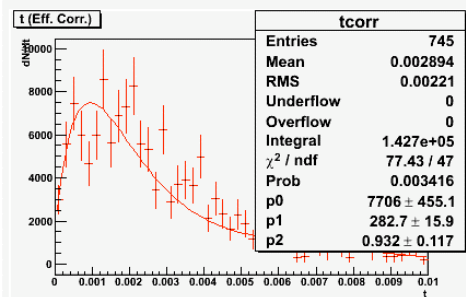
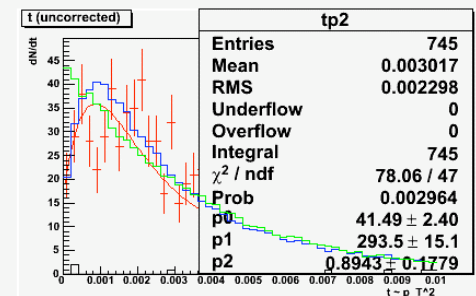
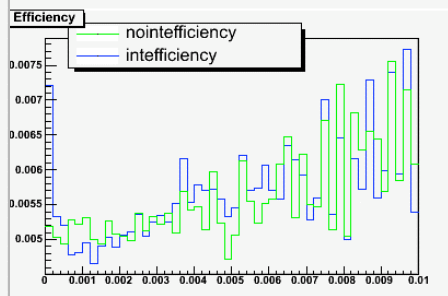
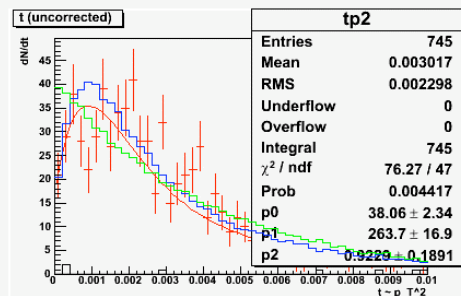
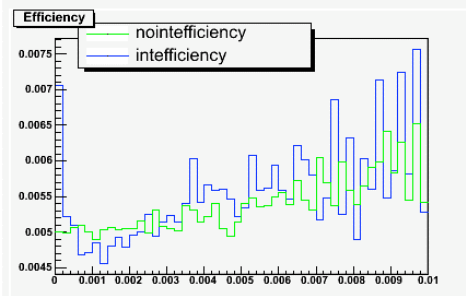
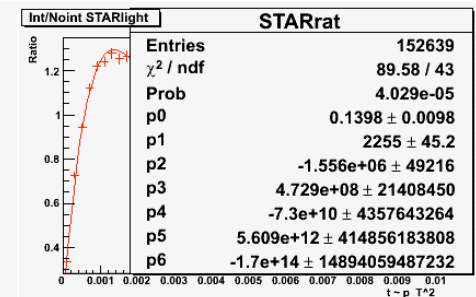
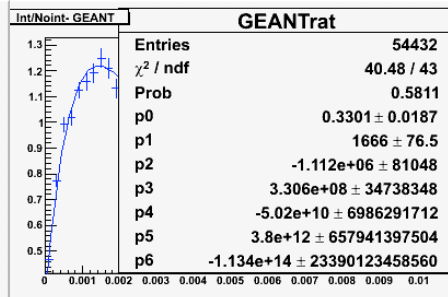
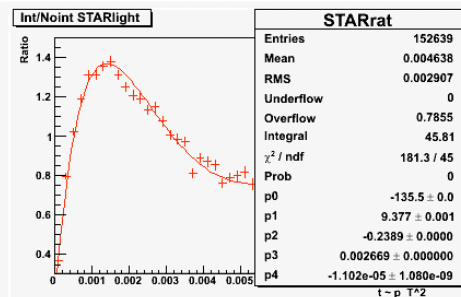
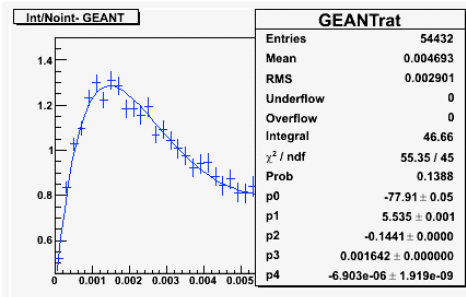
new UPC MinBias  
0.0 < y < 0.5



old UPC MinBias  
 $0.5 < y < 1.0$

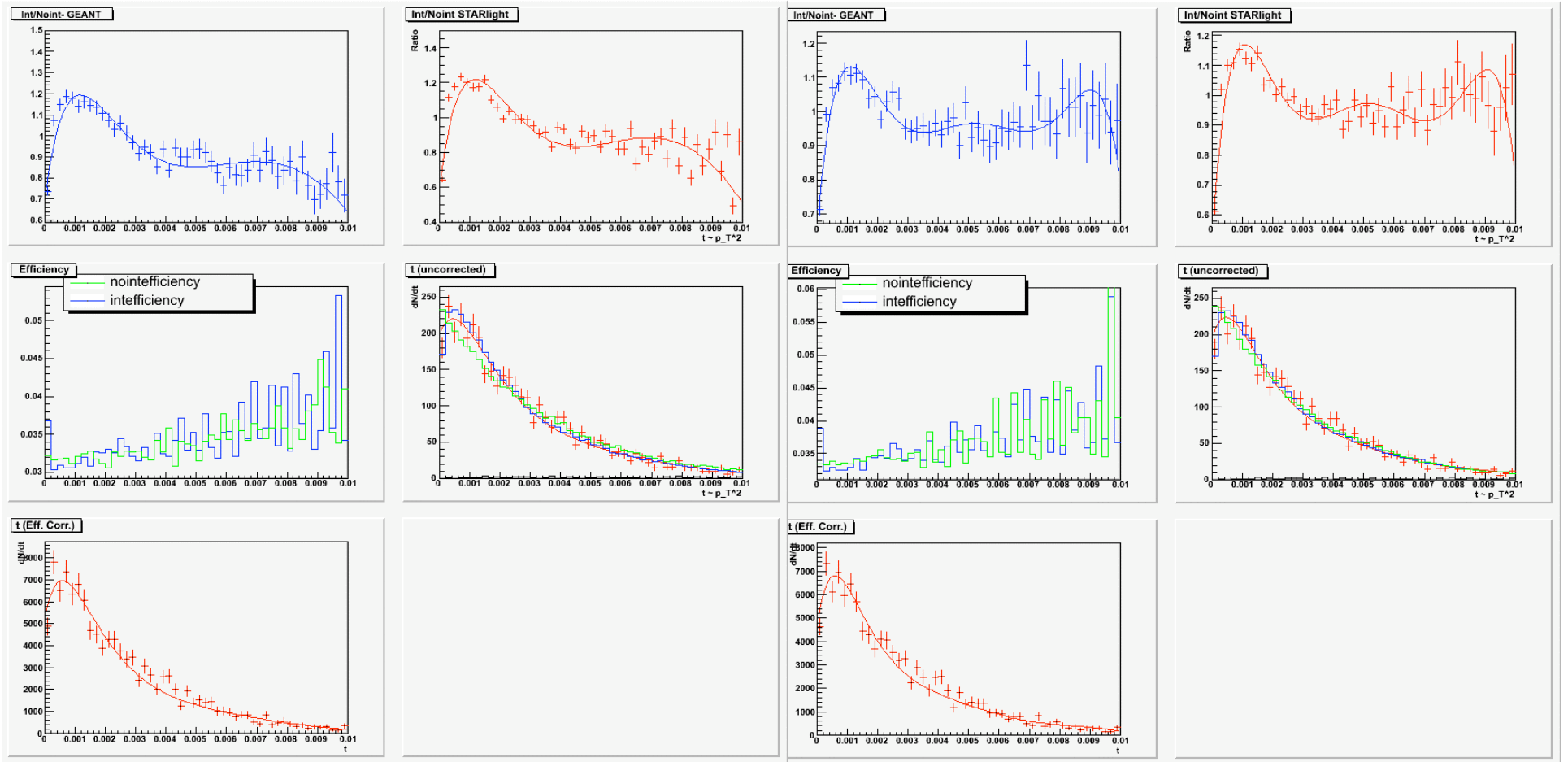
new UPC MinBias  
 $0.5 < y < 1.0$





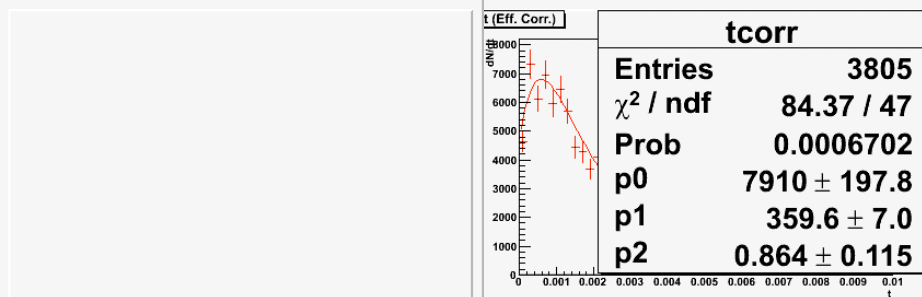
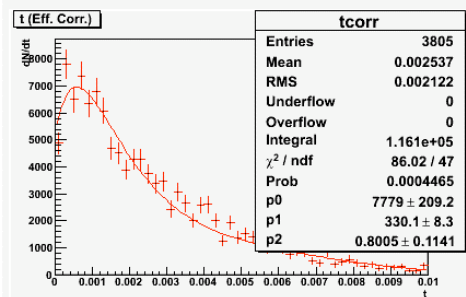
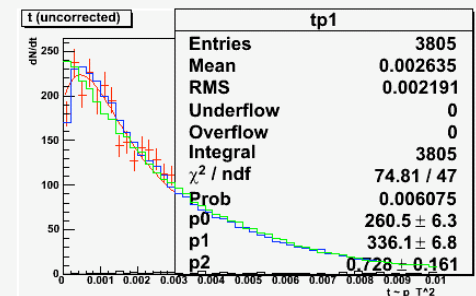
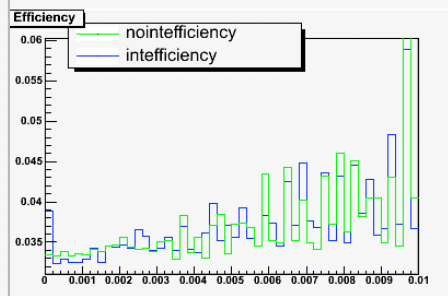
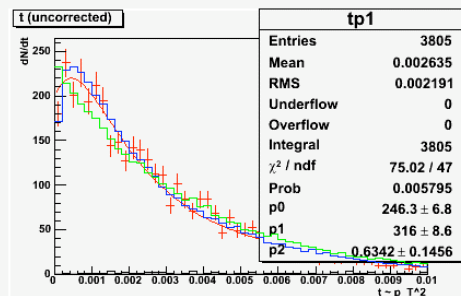
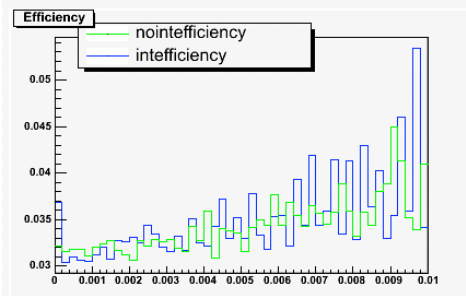
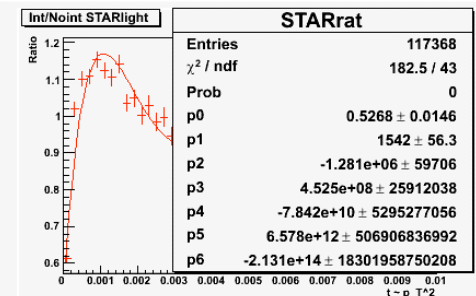
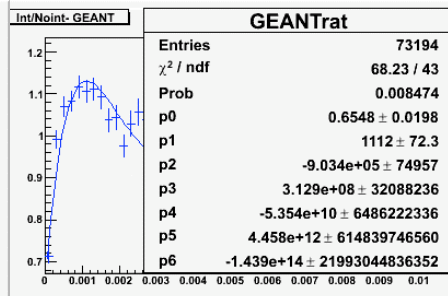
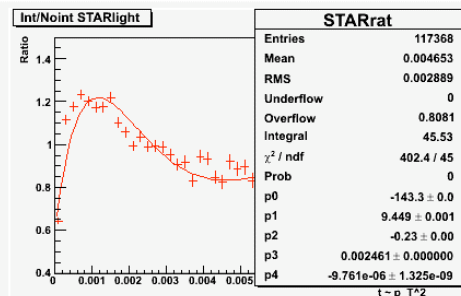
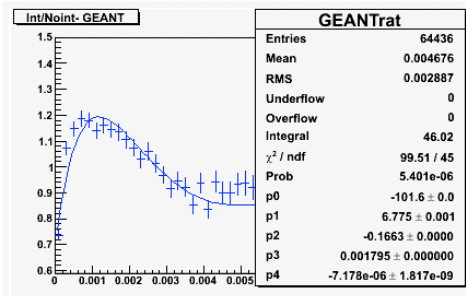
old UPC MinBias  
0.5 < y < 1.0

new UPC MinBias  
0.5 < y < 1.0



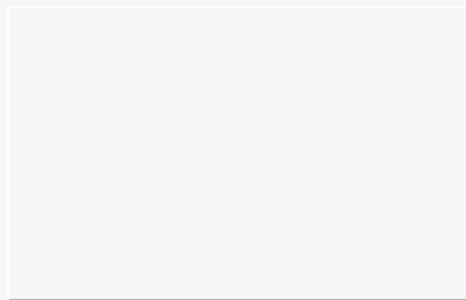
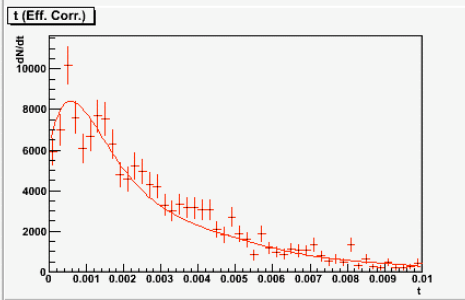
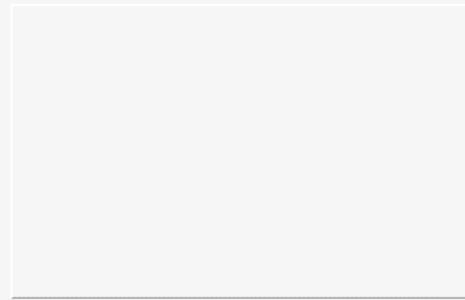
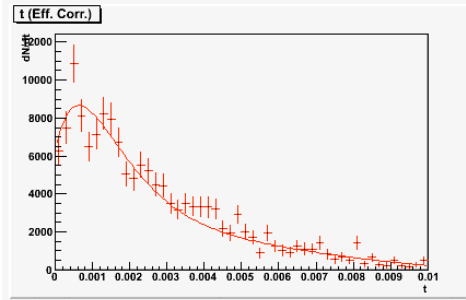
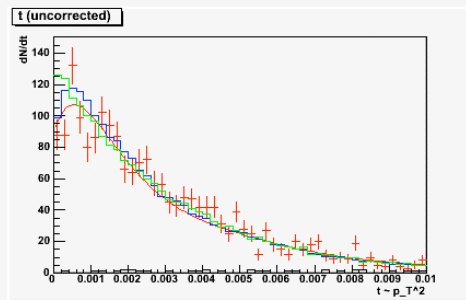
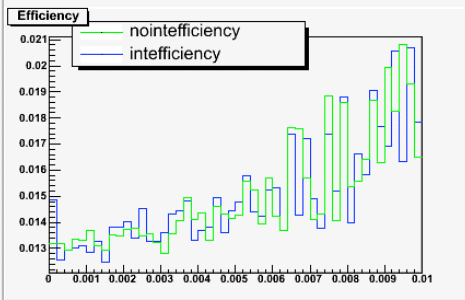
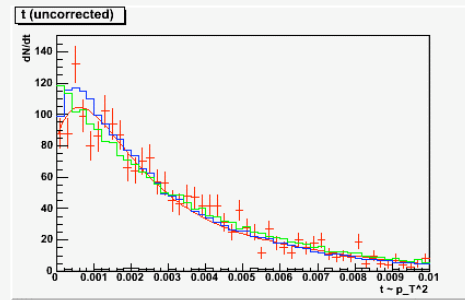
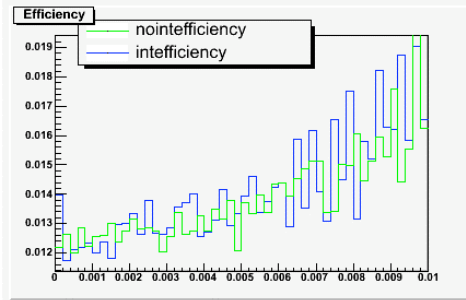
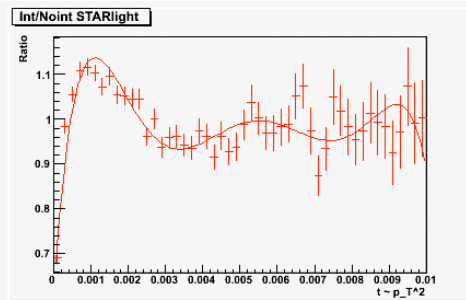
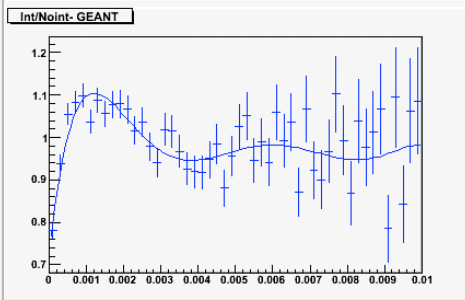
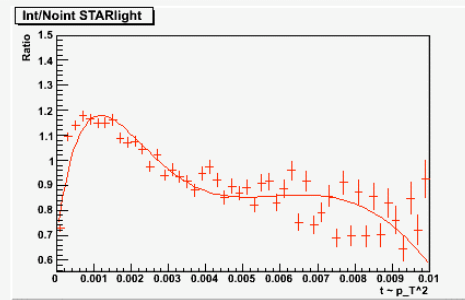
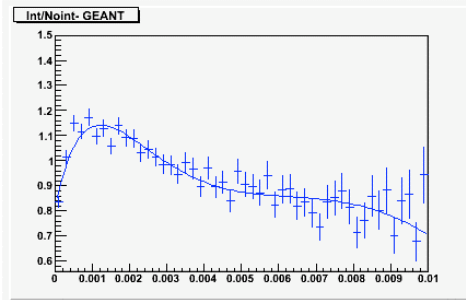
old UPC Topology  
 $0.1 < y < 0.5$

new UPC Topology  
 $0.1 < y < 0.5$



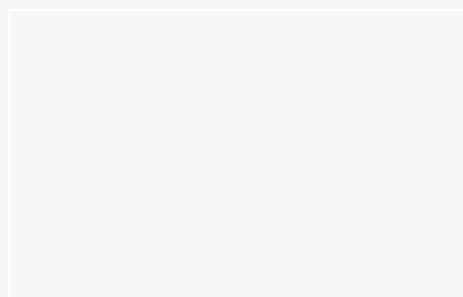
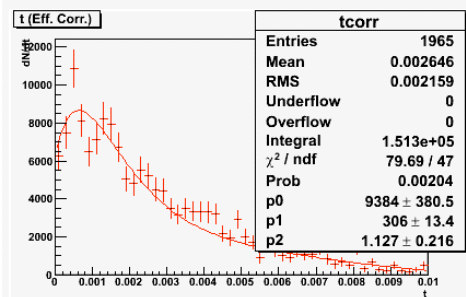
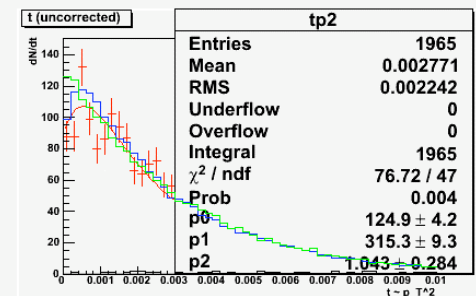
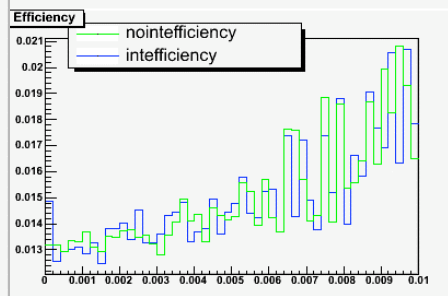
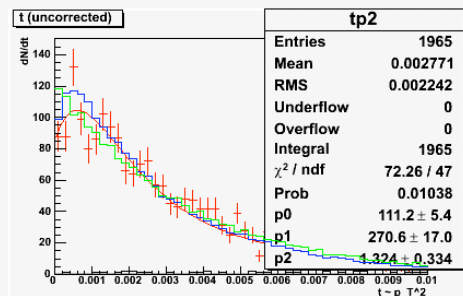
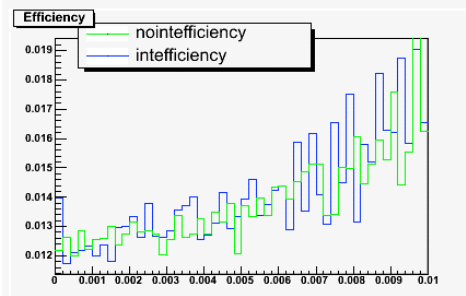
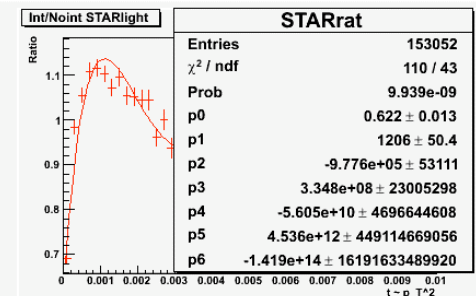
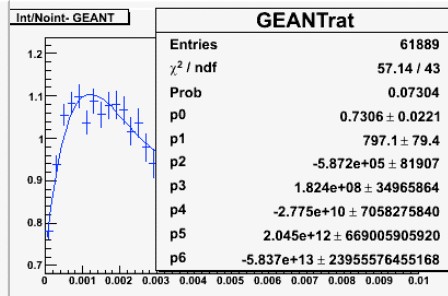
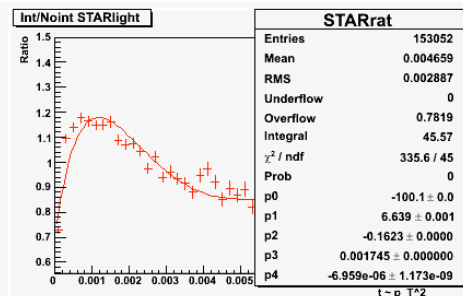
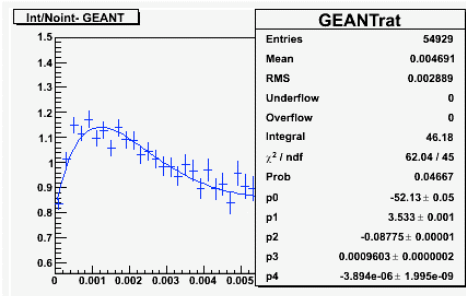
old UPC Topology  
0.1 < y < 0.5

new UPC Topology  
0.1 < y < 0.5



old UPC Topology  
 $0.5 < y < 1.0$

new UPC Topology  
 $0.5 < y < 1.0$



old UPC Topology  
0.5 < y < 1.0

new UPC Topology  
0.5 < y < 1.0

# MC set Summary

	$c_{\text{old}}$	$\chi^2/\text{dof}$	$c_{\text{new}}$	$\chi^2/\text{dof}$
Minbias				
$0.1 < y < 0.5$	$1.01 \pm 0.09$	77/47	$0.95 \pm 0.08$	46/47
$0.5 < y < 1.0$	$0.93 \pm 0.11$	77/47	$0.93 \pm 0.11$	79/47
Topology				
$0.1 < y < 0.5$	$0.80 \pm 0.11$	86/47	$0.86 \pm 0.11$	84/47
$0.5 < y < 1.0$	$1.1 \pm 0.21$	80/47	$0.97 \pm 0.20$	88/47