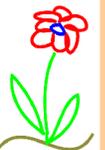


# SVX Passive Material Tuning

Manfred Paulini  
CDF Simulation Meeting  
25 March 2004  
Fermilab

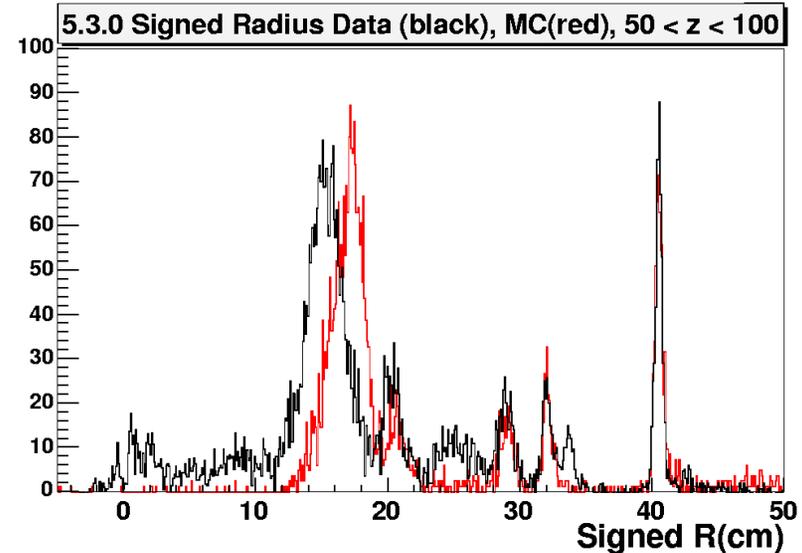
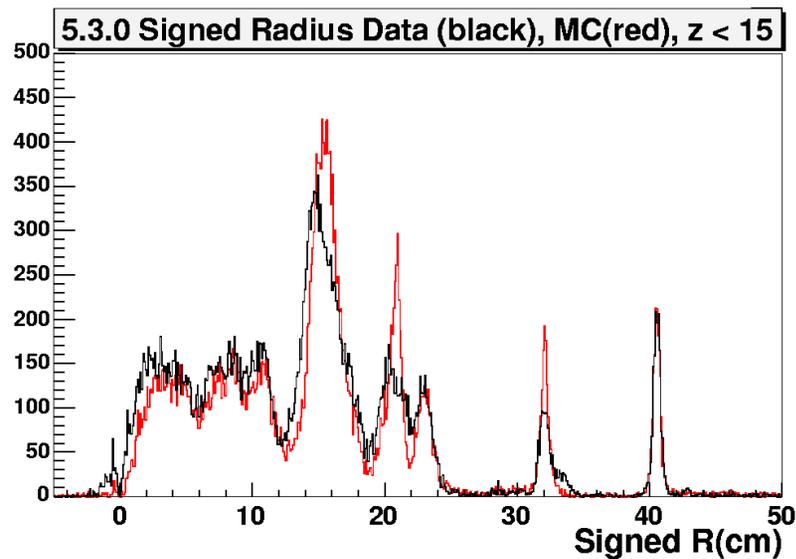
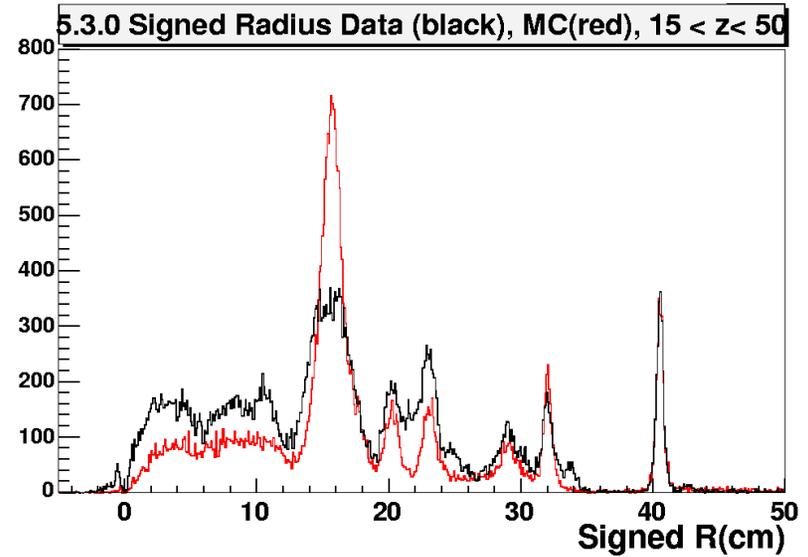
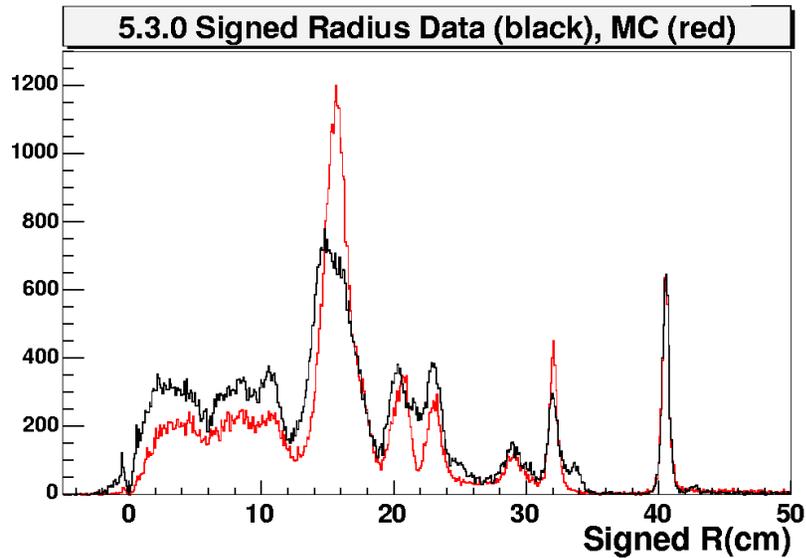
All the hard work done by Vivek Tiwari!

- Compare conversion maps in 5.3.1(pre5) simulation with 5.1 conversion data
- First attempts to better tune PhantomLayers
- Generate FakeEvent events with 10 photons each
- No trigger simulation but care was taken to match MC to data
- Still normalize to COT inner can
- New: Only look at conversions within  $|\eta| < 0.1$  in more z-bins



# Conversion Maps

Conversion maps shown by Soon at Jan. collaboration mtg (default in 5.3.1)

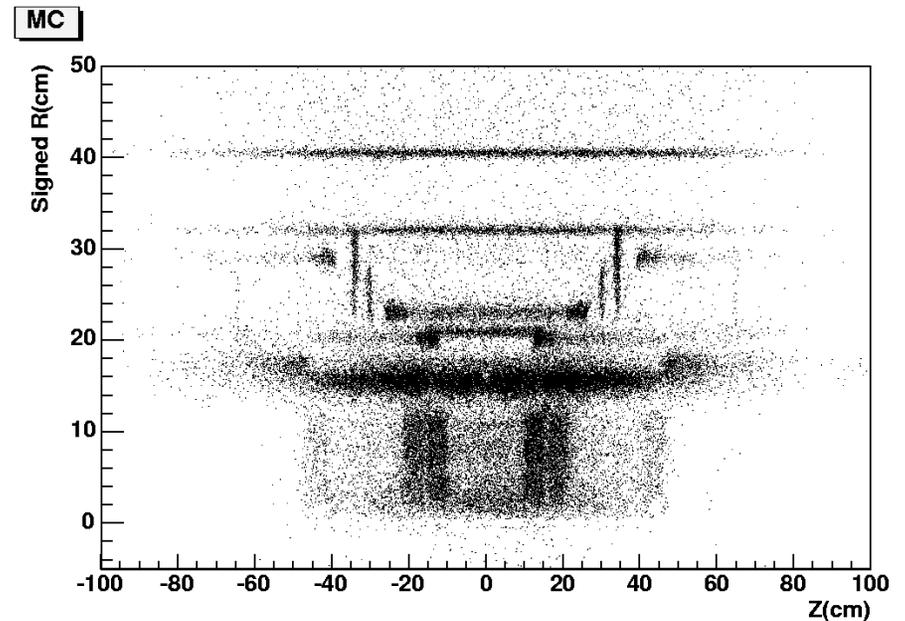
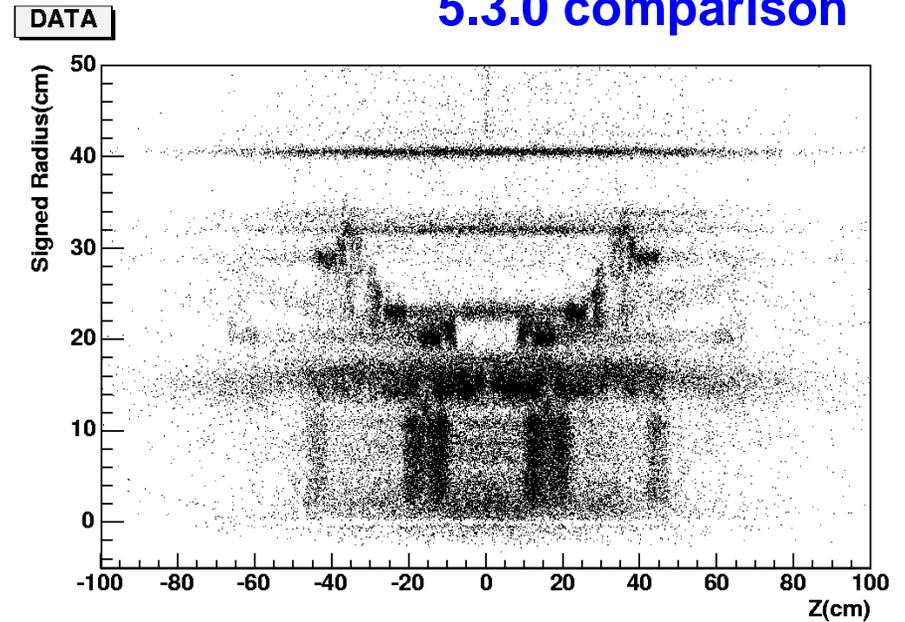


# Conversion Maps

Try to improve comparison of conversion maps:

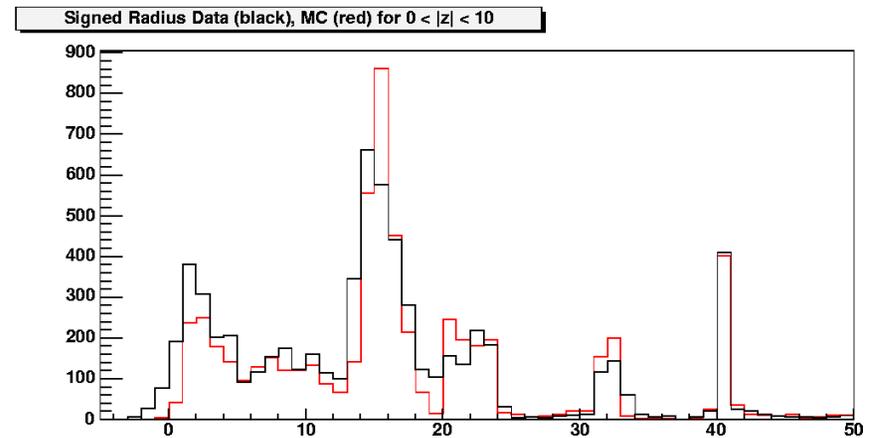
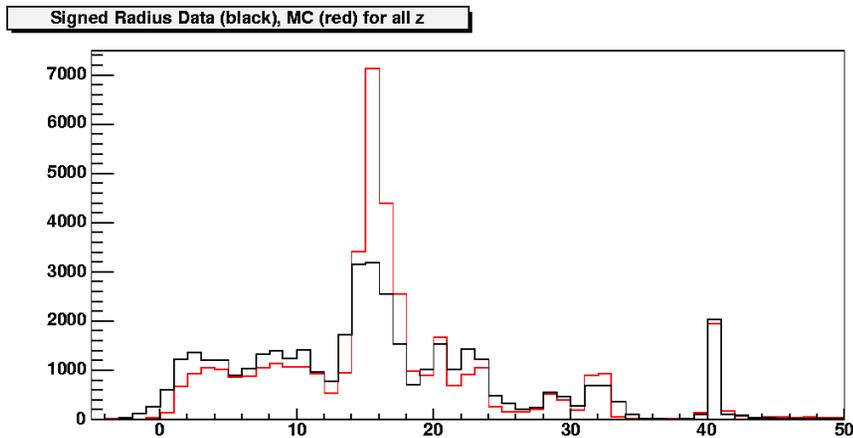
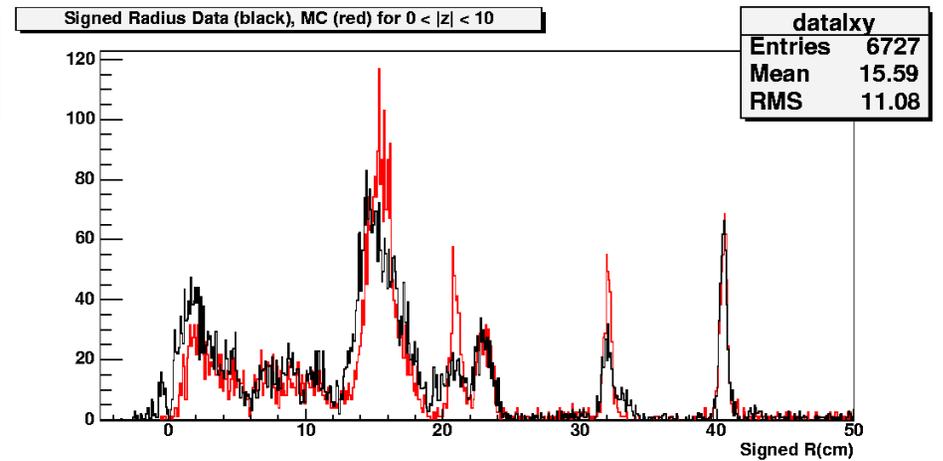
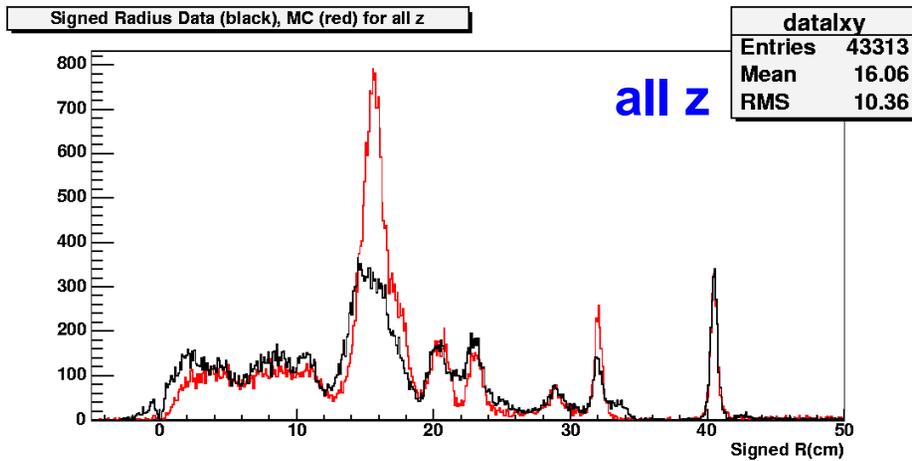
- Try to avoid conversions going through too much material
- Consider only conversions going straight up ( $|\eta| < 0.1$ )
- Make finer bins along z

## 5.3.0 comparison



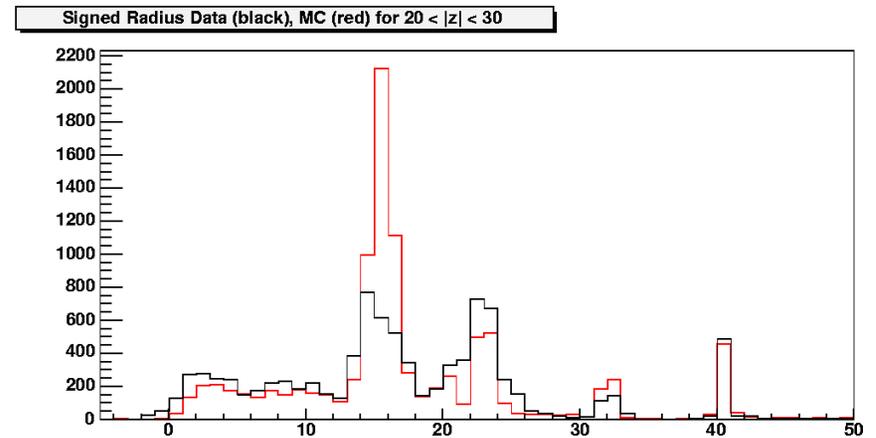
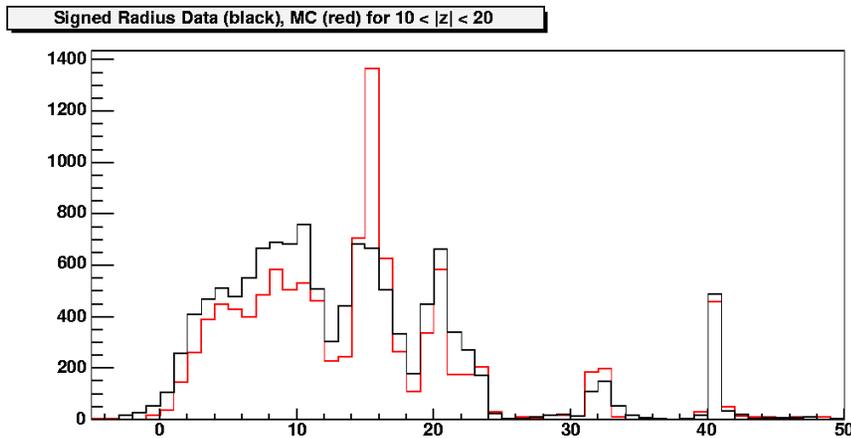
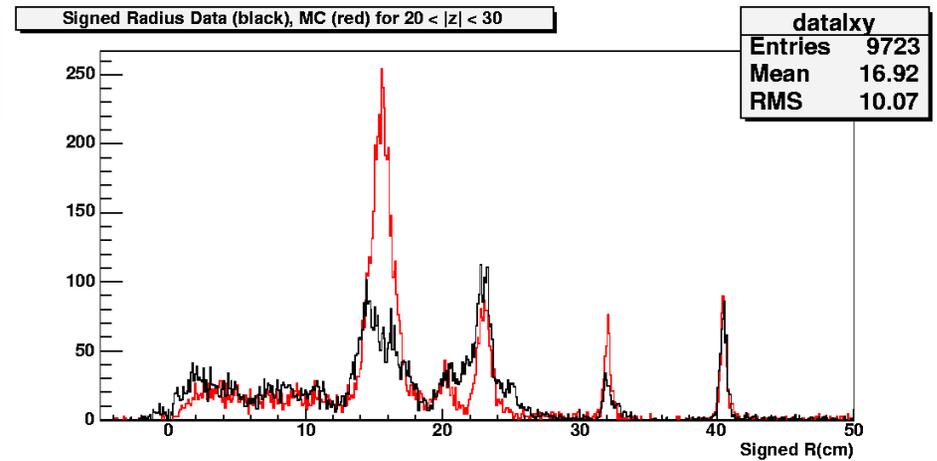
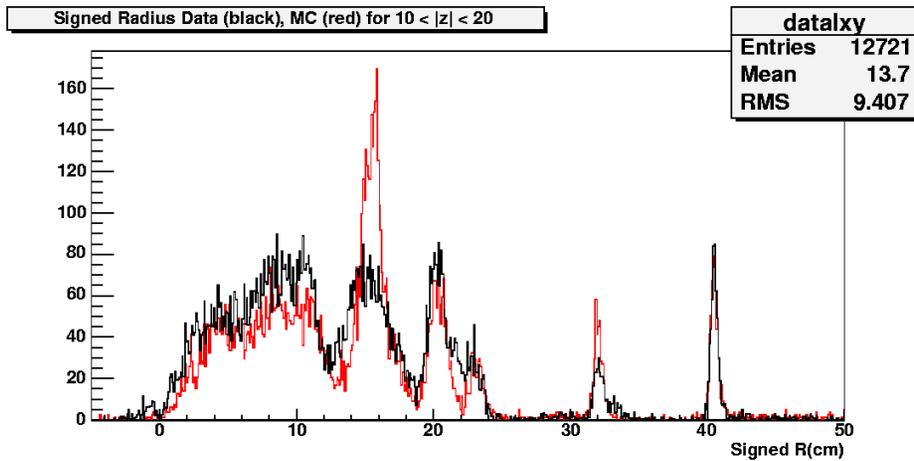
# Conversion Maps

## 5.3.1 default settings in simulation:



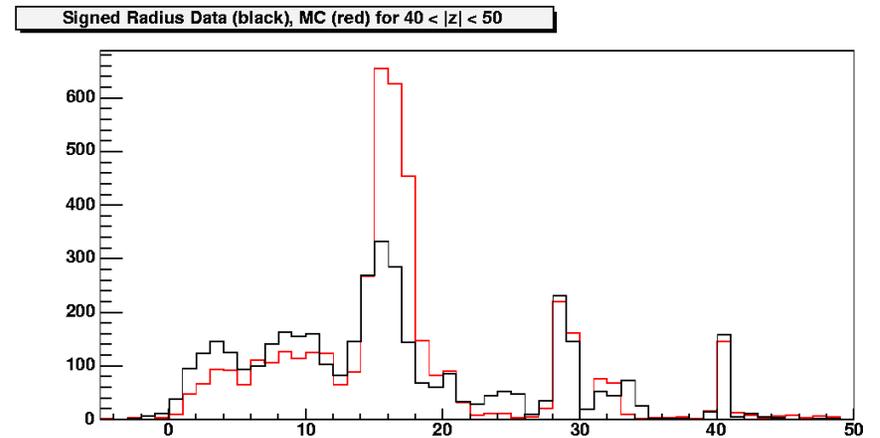
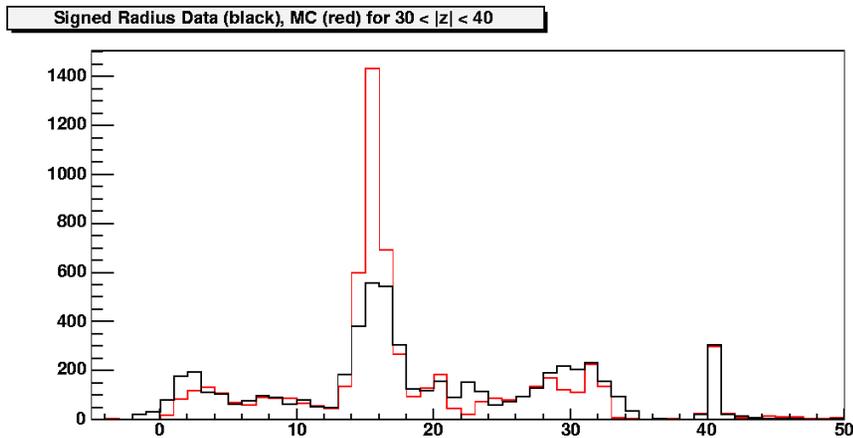
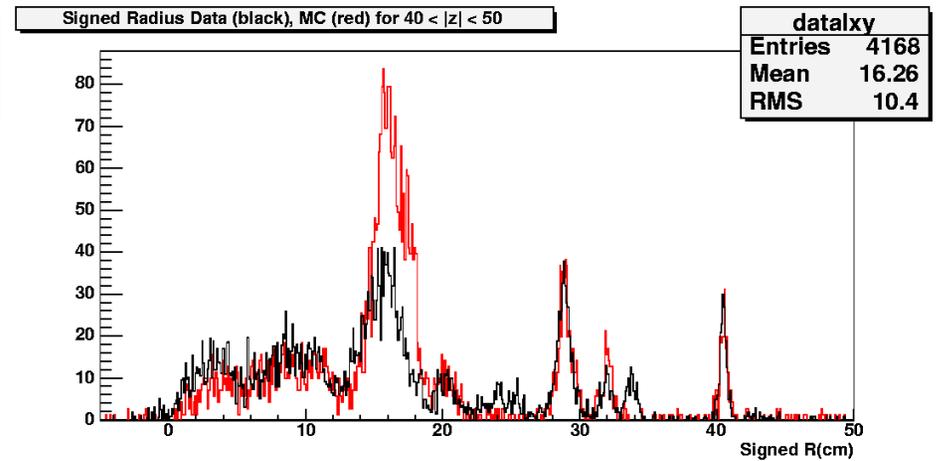
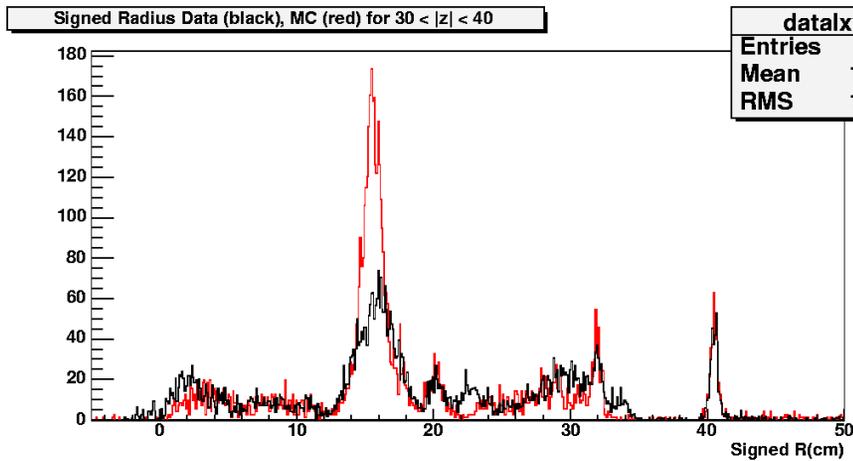
# Conversion Maps

## 5.3.1 default settings in simulation:



# Conversion Maps

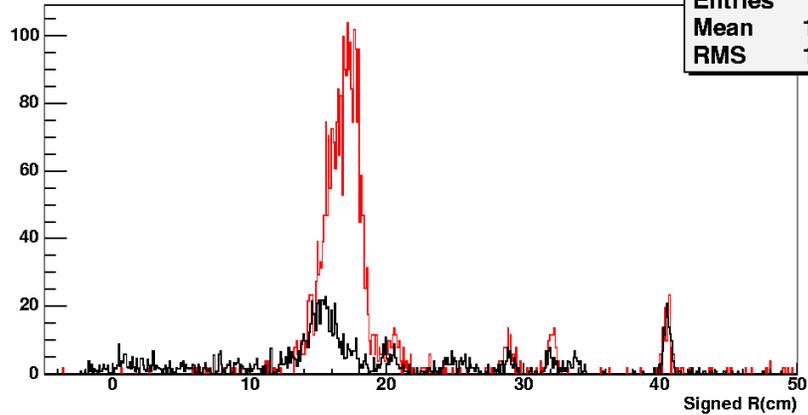
## 5.3.1 default settings in simulation:



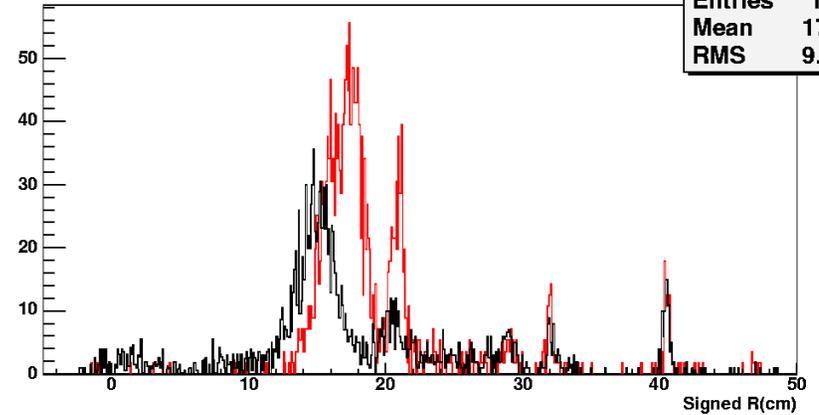
# Conversion Maps

## 5.3.1 default settings in simulation:

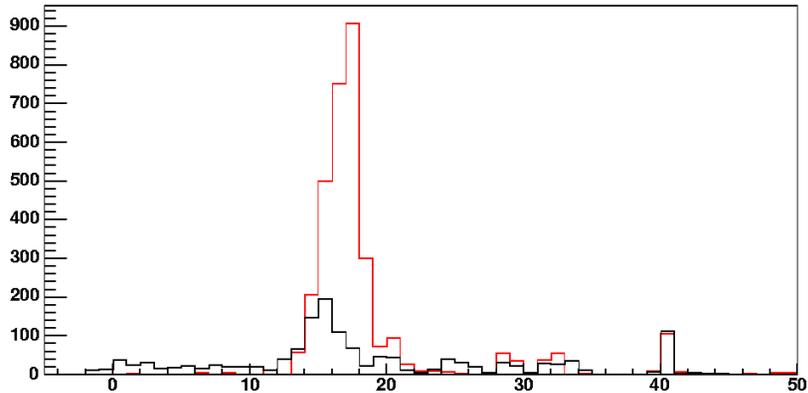
Signed Radius Data (black), MC (red) for  $50 < |z| < 60$



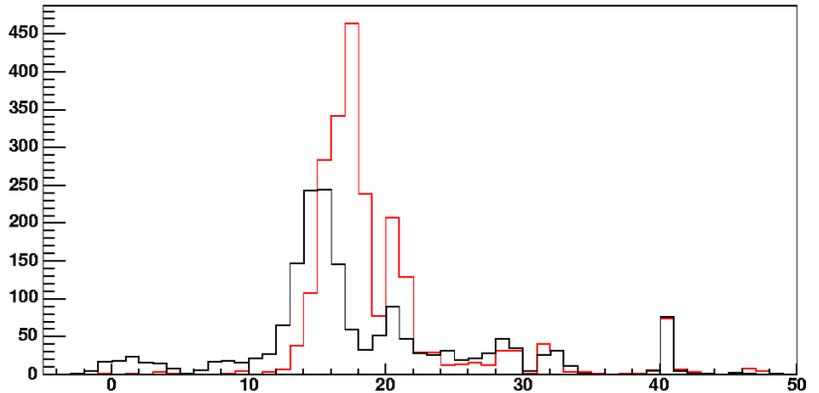
Signed Radius Data (black), MC (red) for  $60 < |z| < 100$



Signed Radius Data (black), MC (red) for  $50 < |z| < 60$

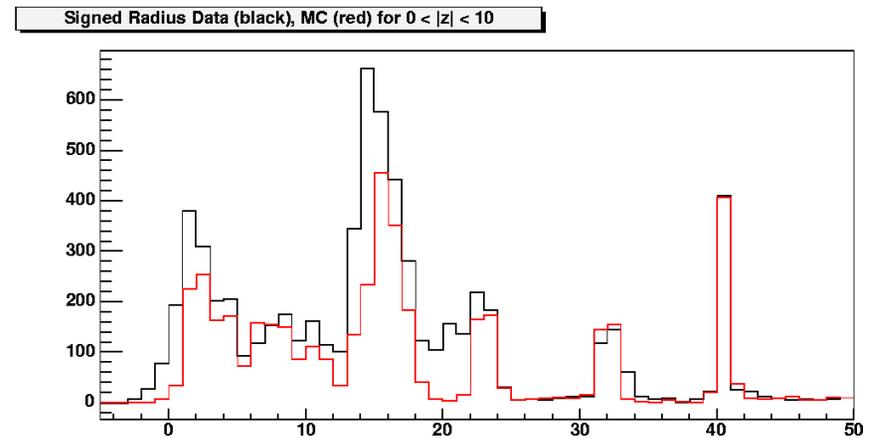
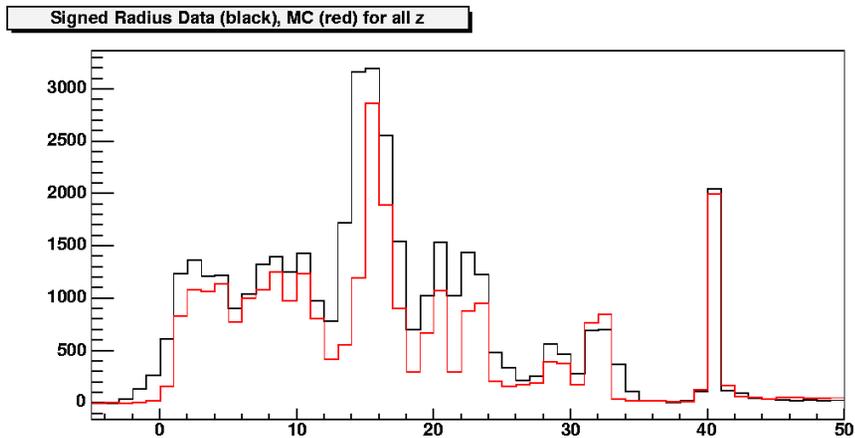
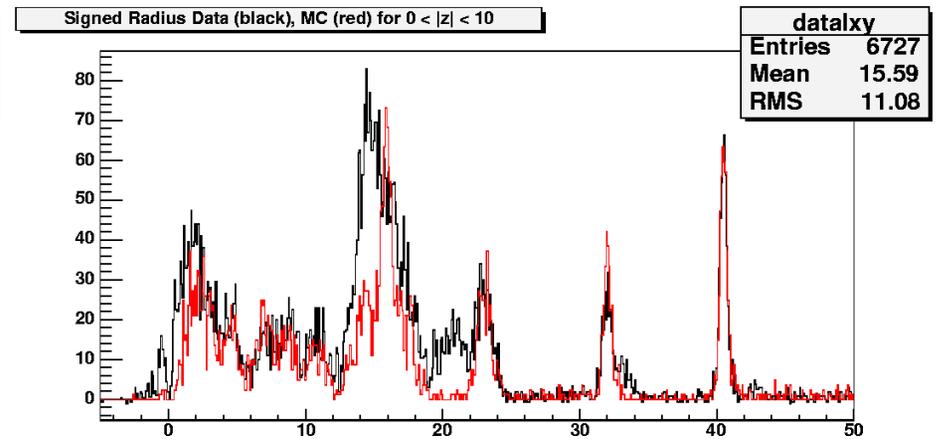
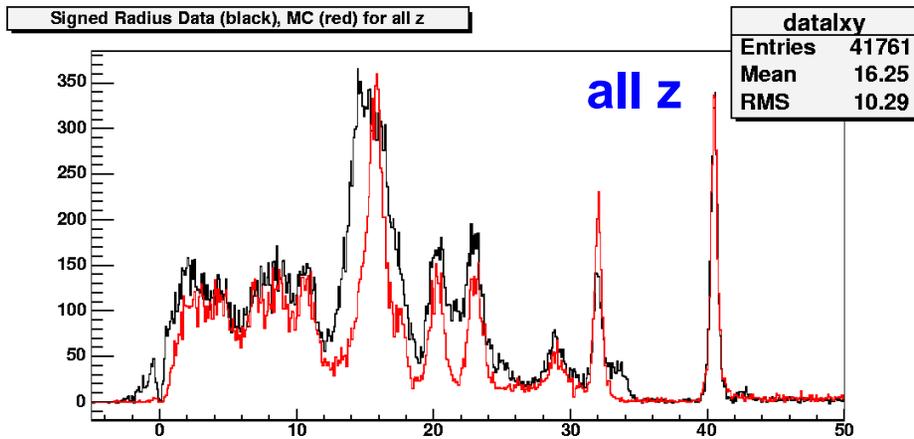


Signed Radius Data (black), MC (red) for  $60 < |z| < 100$



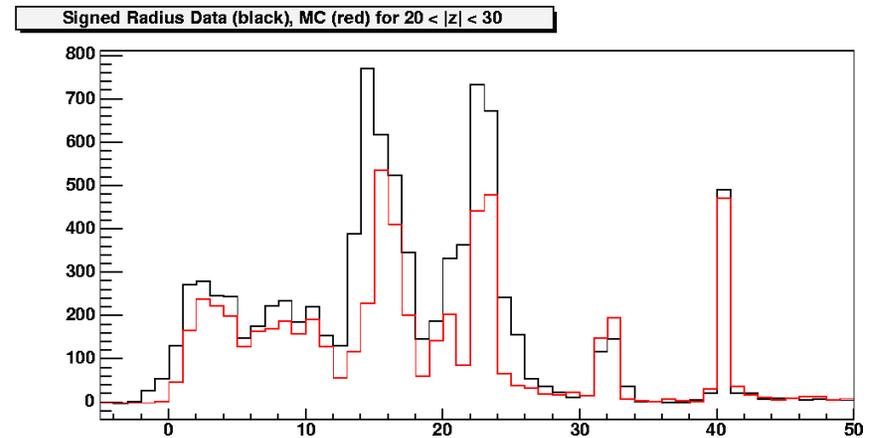
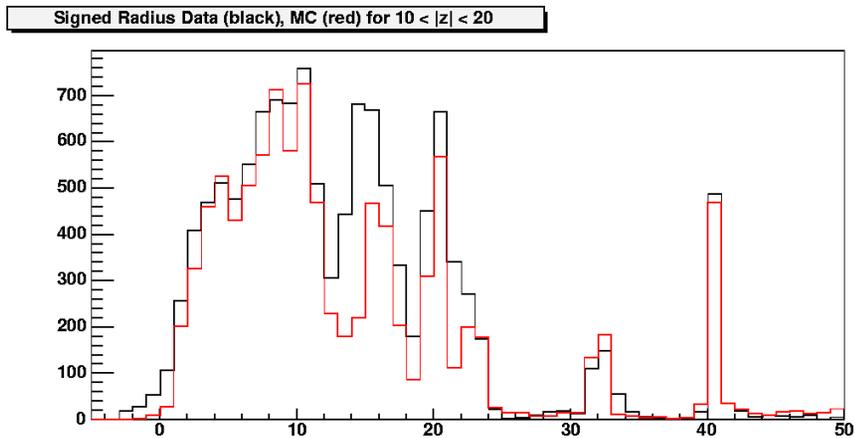
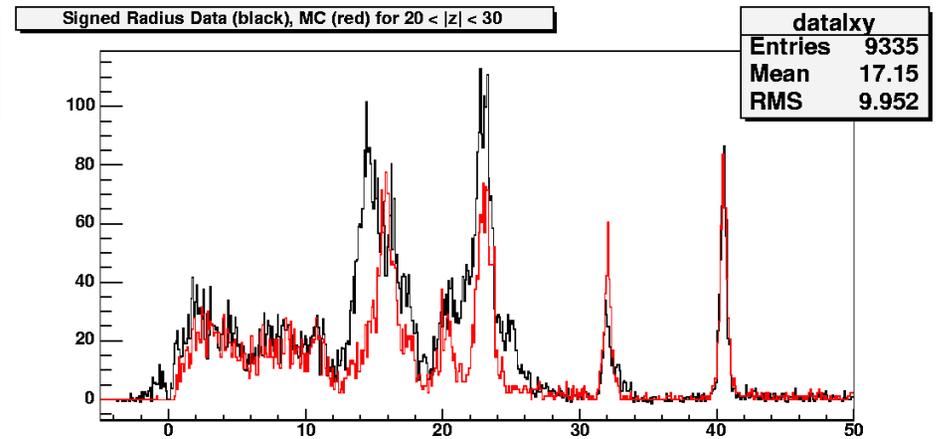
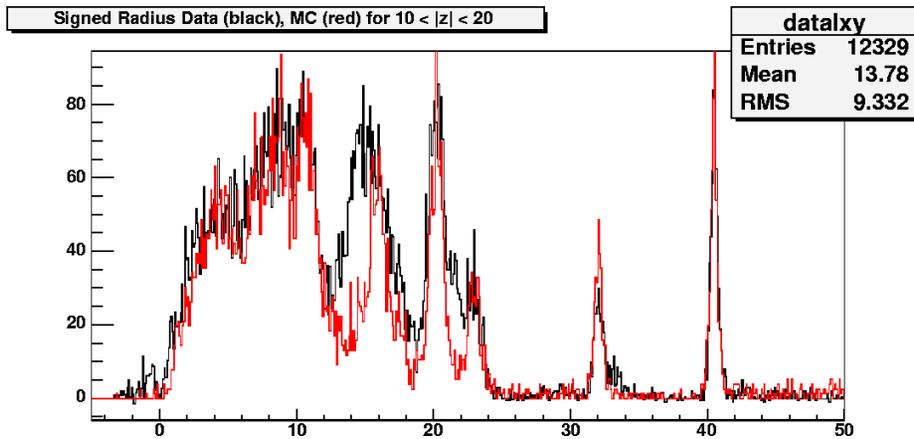
# Conversion Maps

## 5.3.1 No PhantomLayer turned on:



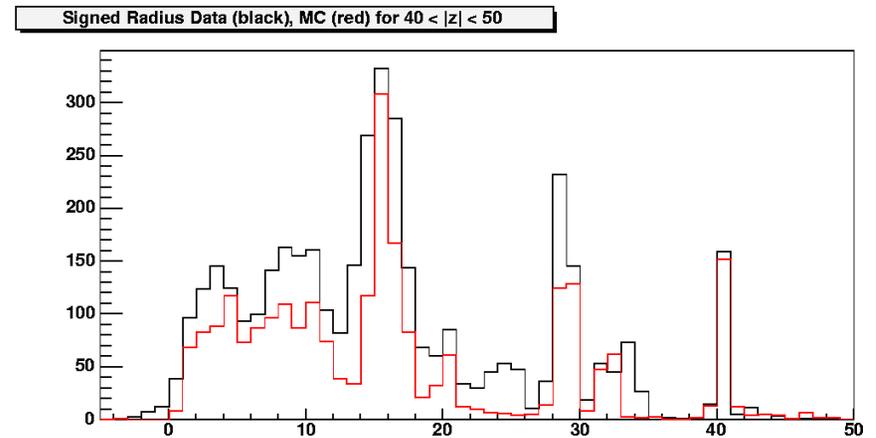
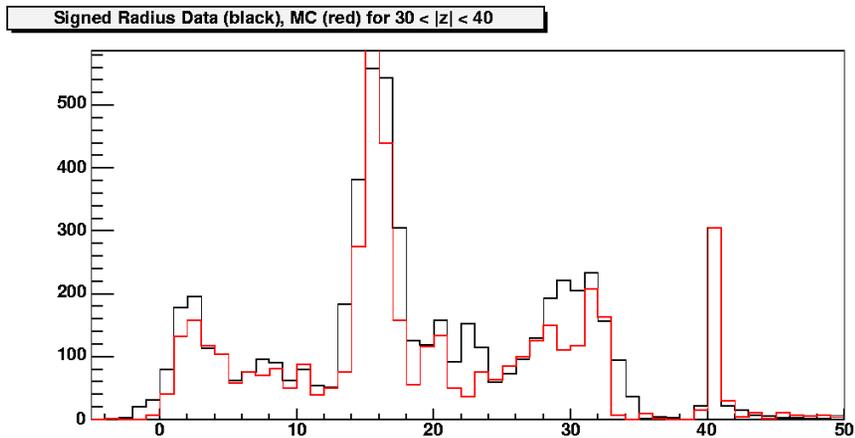
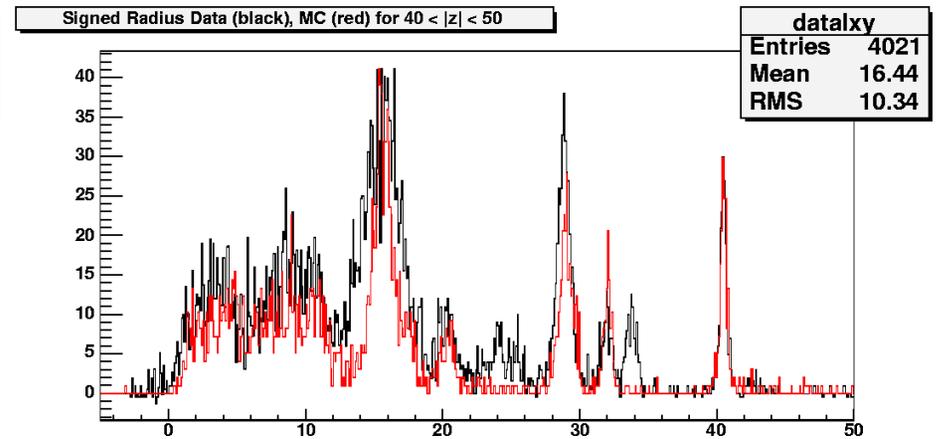
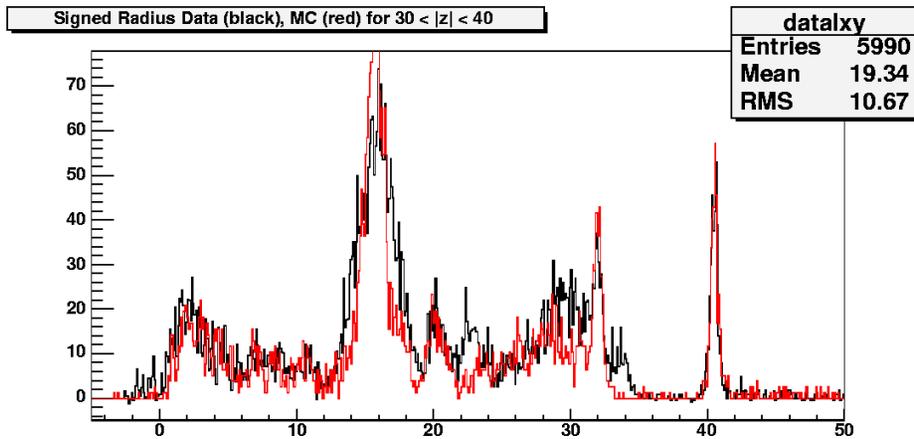
# Conversion Maps

## 5.3.1 No PhantomLayer turned on:



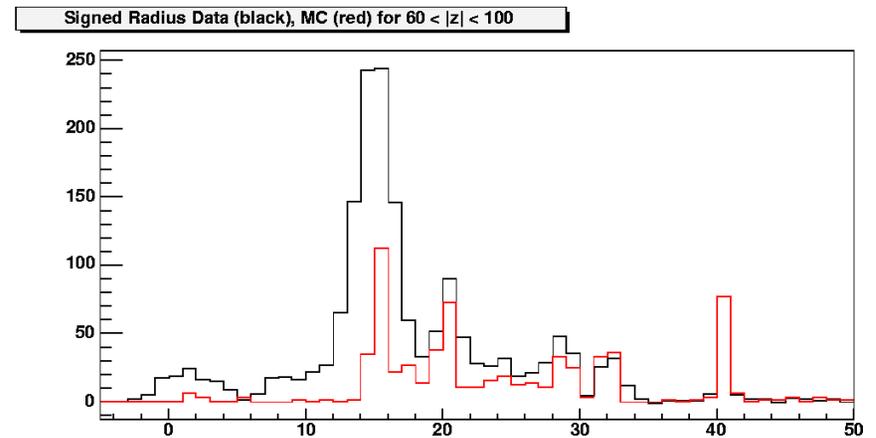
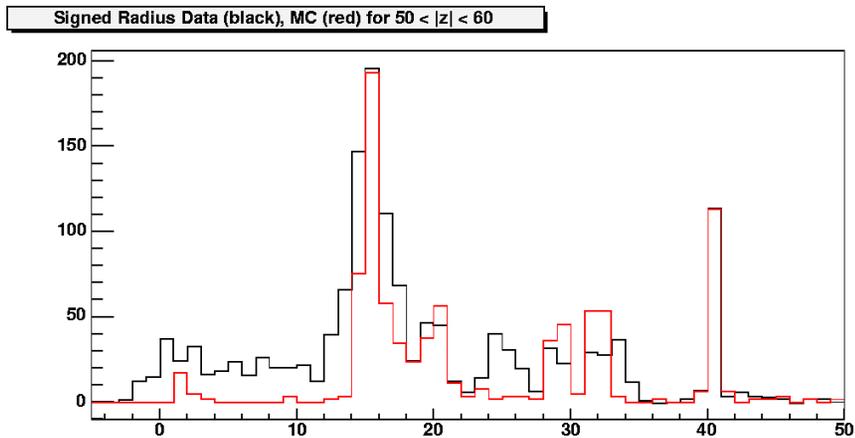
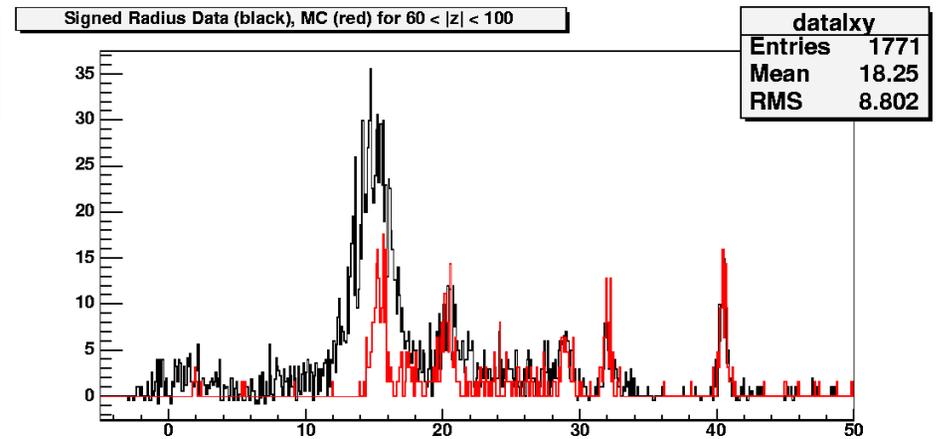
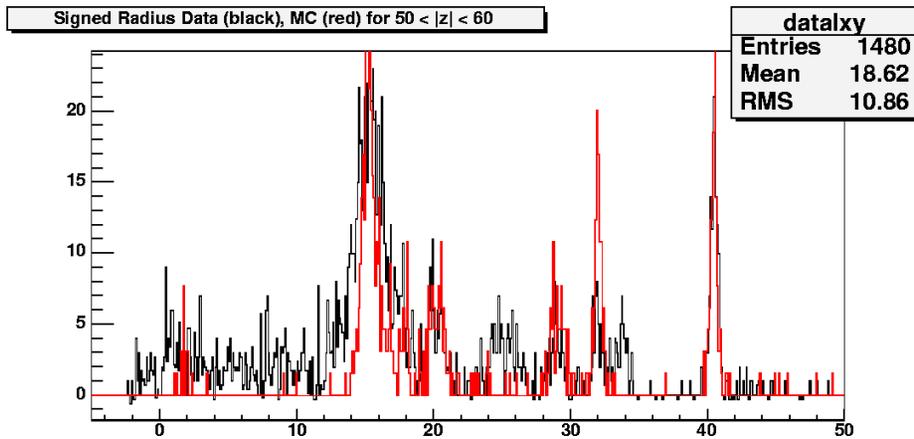
# Conversion Maps

## 5.3.1 No PhantomLayer turned on:



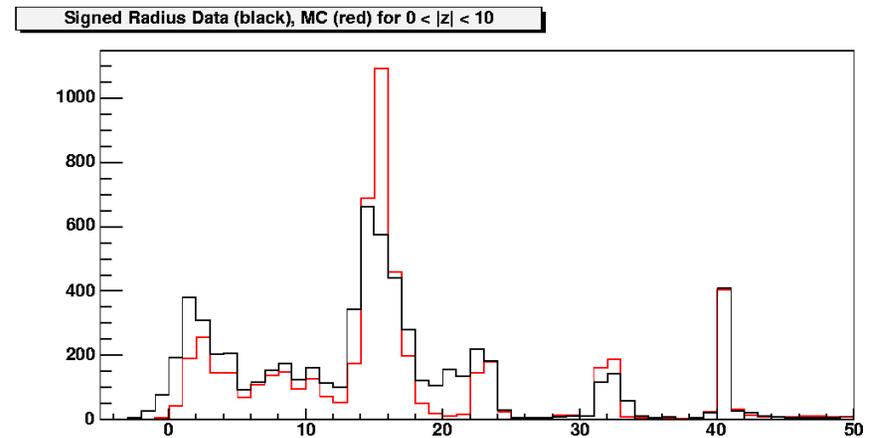
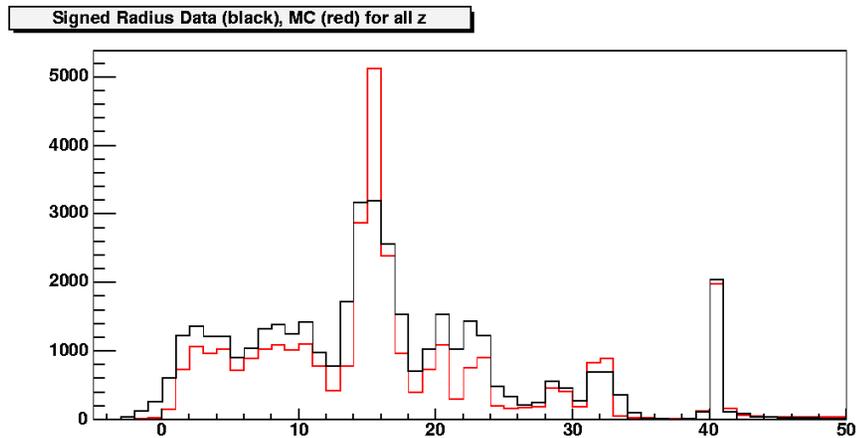
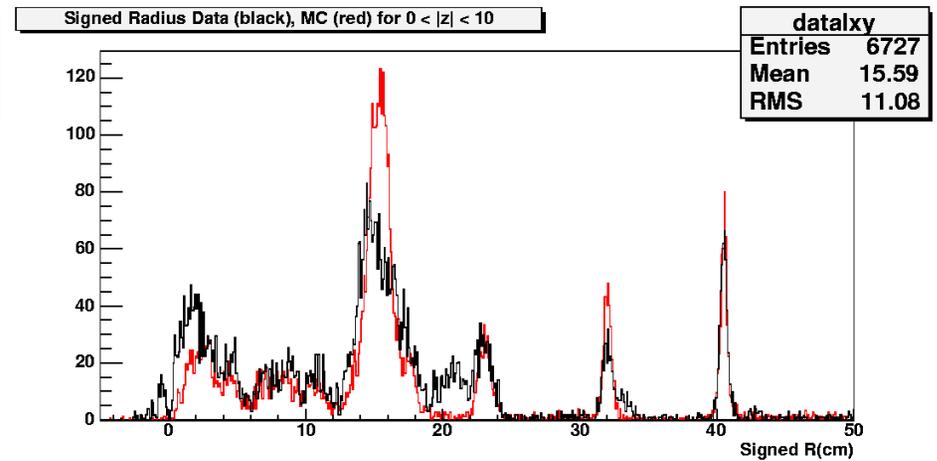
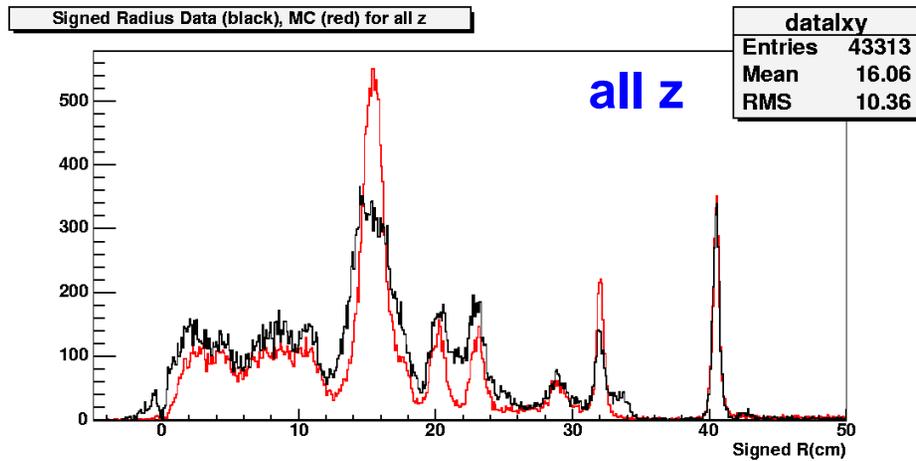
# Conversion Maps

## 5.3.1 No PhantomLayer turned on:



# Conversion Maps

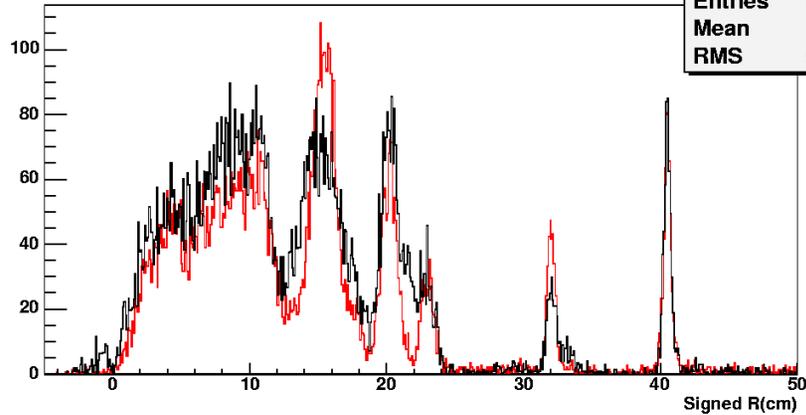
First attempt to tune (focus on  $r=15\text{cm}$  region):



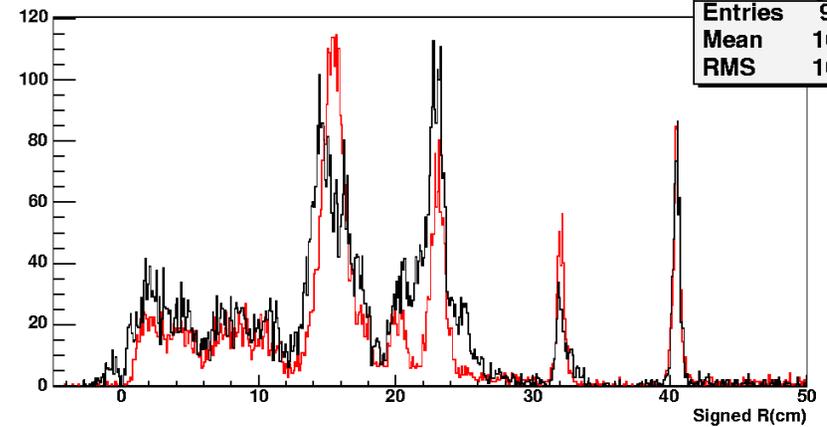
# Conversion Maps

First attempt to tune (focus on  $r=15\text{cm}$  region):

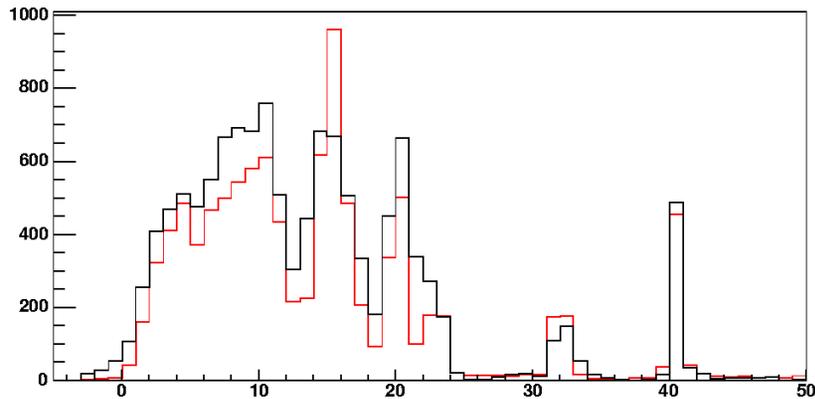
Signed Radius Data (black), MC (red) for  $10 < |z| < 20$



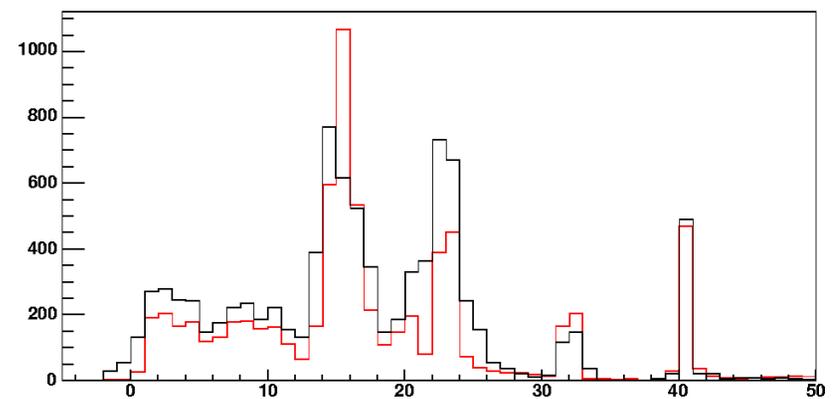
Signed Radius Data (black), MC (red) for  $20 < |z| < 30$



Signed Radius Data (black), MC (red) for  $10 < |z| < 20$

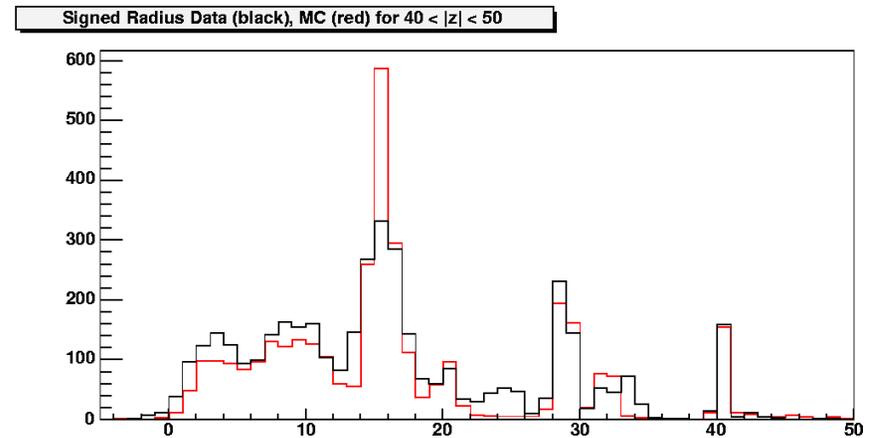
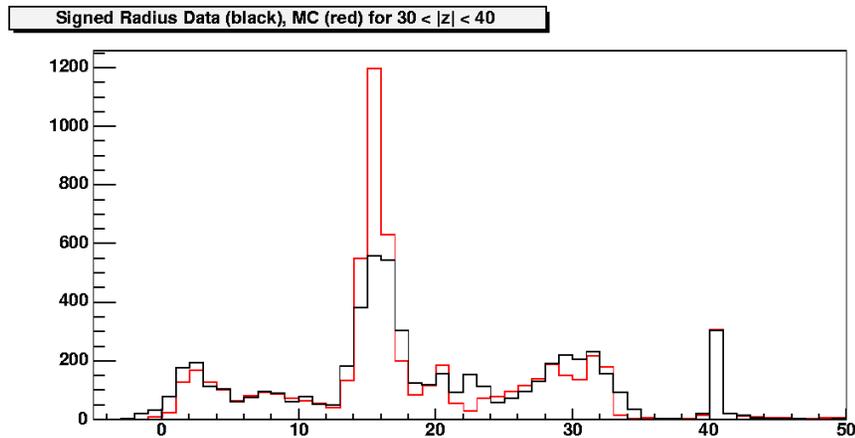
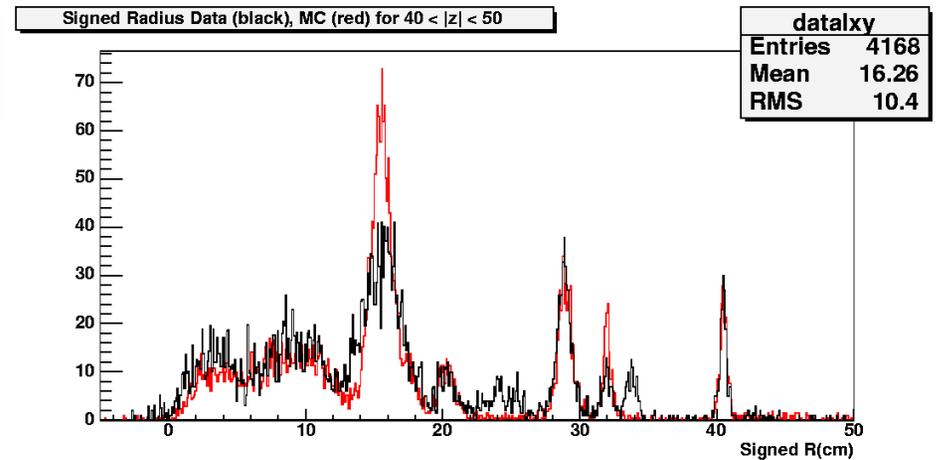
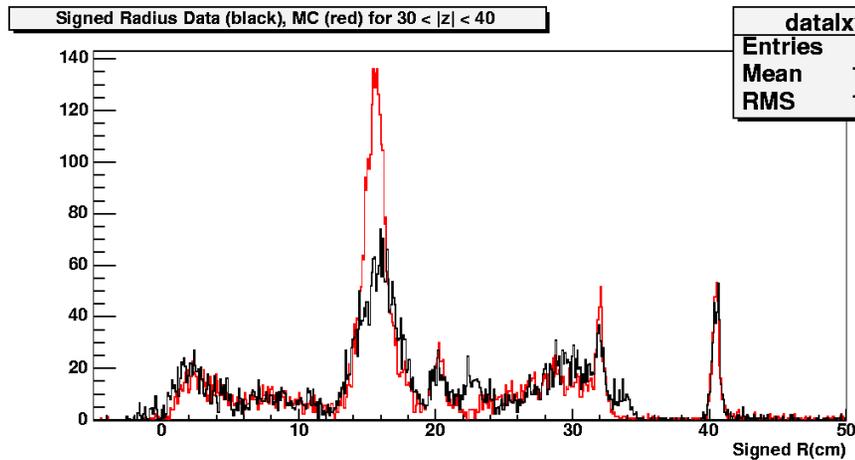


Signed Radius Data (black), MC (red) for  $20 < |z| < 30$



# Conversion Maps

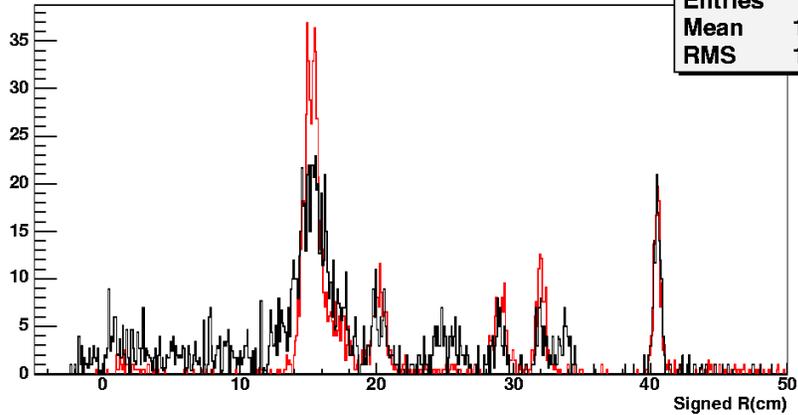
First attempt to tune (focus on  $r=15\text{cm}$  region):



# Conversion Maps

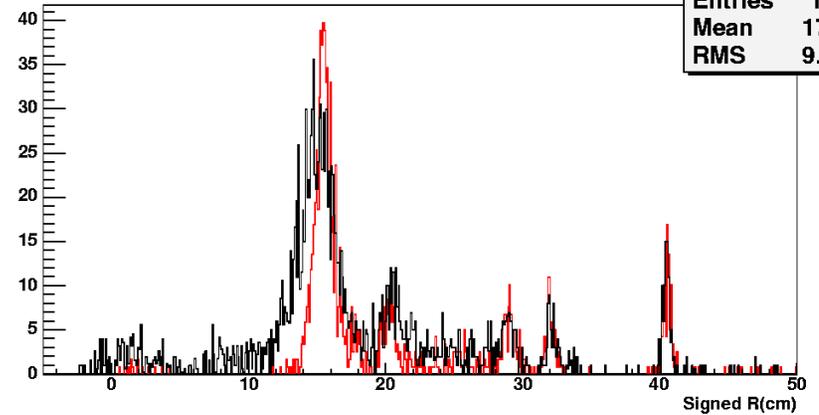
First attempt to tune (focus on  $r=15\text{cm}$  region):

Signed Radius Data (black), MC (red) for  $50 < |z| < 60$



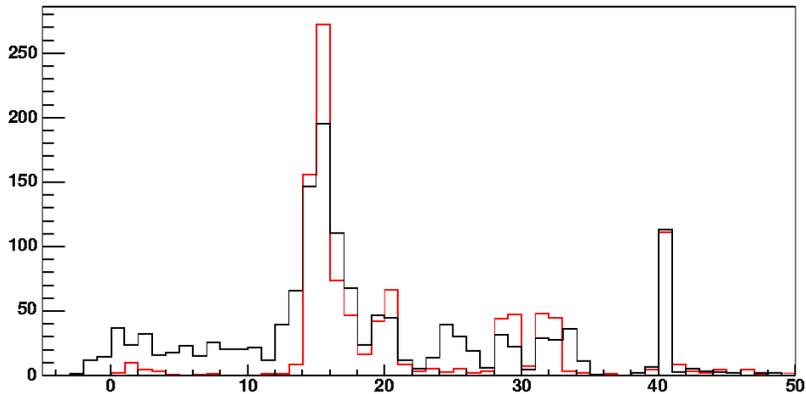
datalxy	
Entries	1539
Mean	18.33
RMS	10.97

Signed Radius Data (black), MC (red) for  $60 < |z| < 100$

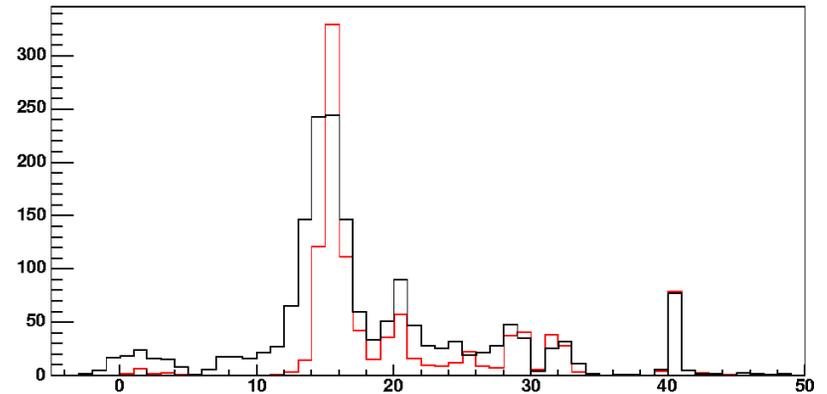


datalxy	
Entries	1859
Mean	17.89
RMS	9.026

Signed Radius Data (black), MC (red) for  $50 < |z| < 60$



Signed Radius Data (black), MC (red) for  $60 < |z| < 100$



## Summary

- **Indications for less material needed for PhantomLayer**
- **Continue tuning (include  $r = 22$  cm region)**
- **Need to learn how to use interactive Geant to better position PhantomLayers (avoid overlaps)**

