

## Nine materials present in ecalgeo.g21

h5009 N geantinos ALUMINIUM

h5015 N geantinos AIR

h5022 N geantinos POLYSTYREN

h5026 N geantinos ECAL\_PVC

h5027 N geantinos ECAL\_PBALLOY

h5028 N geantinos ECAL\_STEEL

h5032 N geantinos ECAL\_SCINT

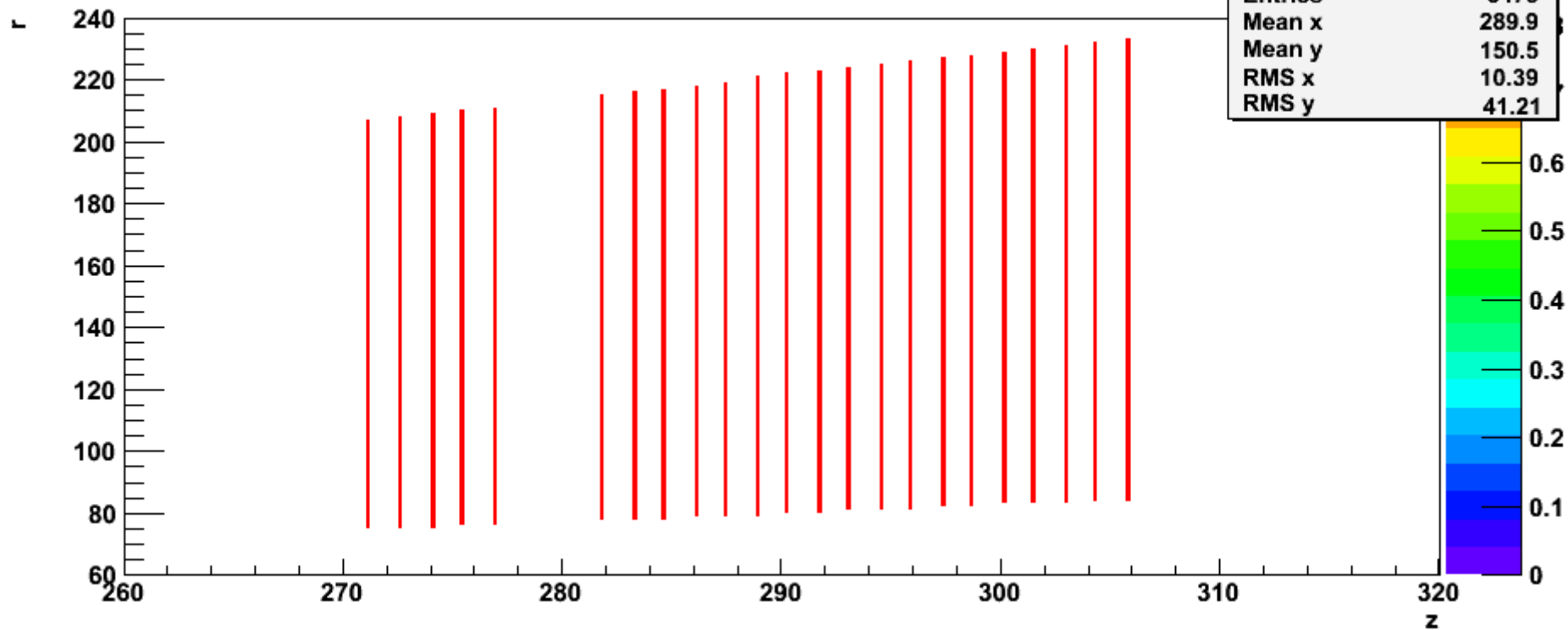
h5033 N geantinos ECAL\_EBLS

h5034 N geantinos ECAL\_EFLS

### Method:

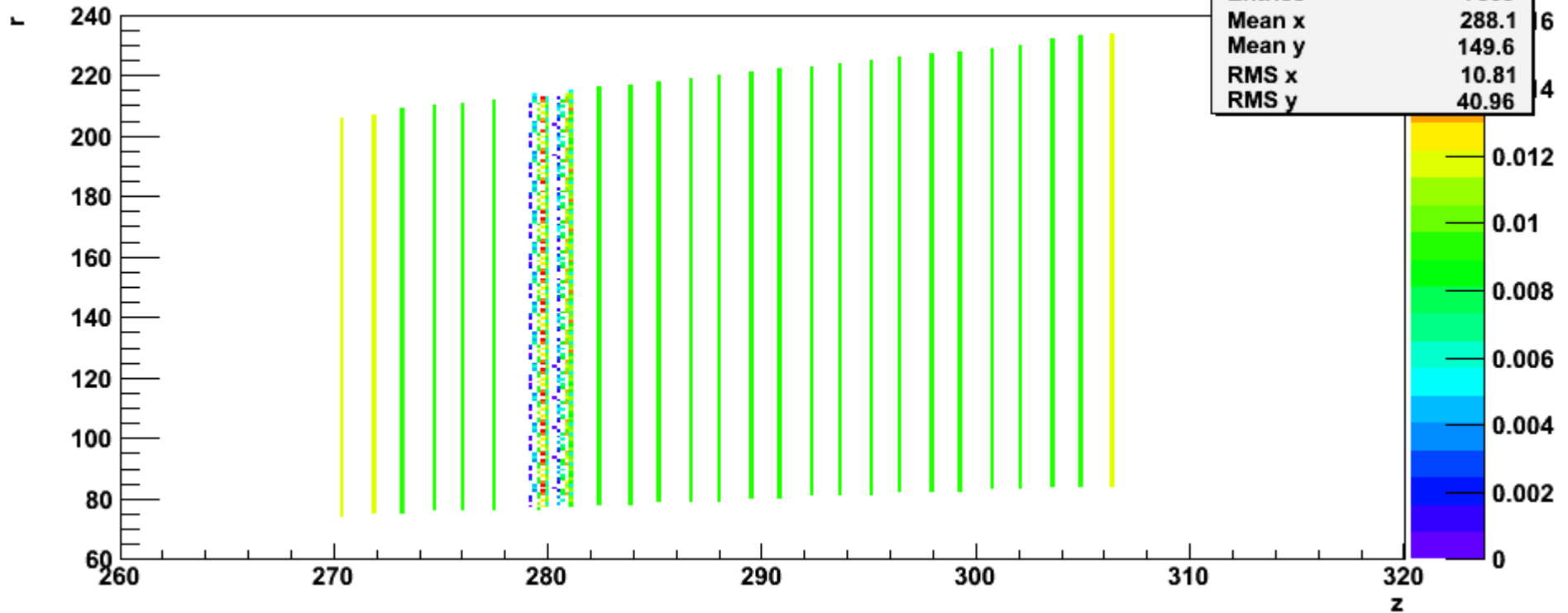
- 1) Throw geantinos normal to front face of the EEMC
- 2)  $\phi = 90$  degrees
- 3) Step vertex from  $r = 0.5$  to  $r = 249.5$  in 1cm steps
- 4) Determine number of radiation lengths of material in each track step
- 5) Store number of radiation lengths in a 2D histogram, at given  $r, z$
- 6) Store number of geantinos crossing, etc...

Material ECAL\_PBALLOY in rad.len

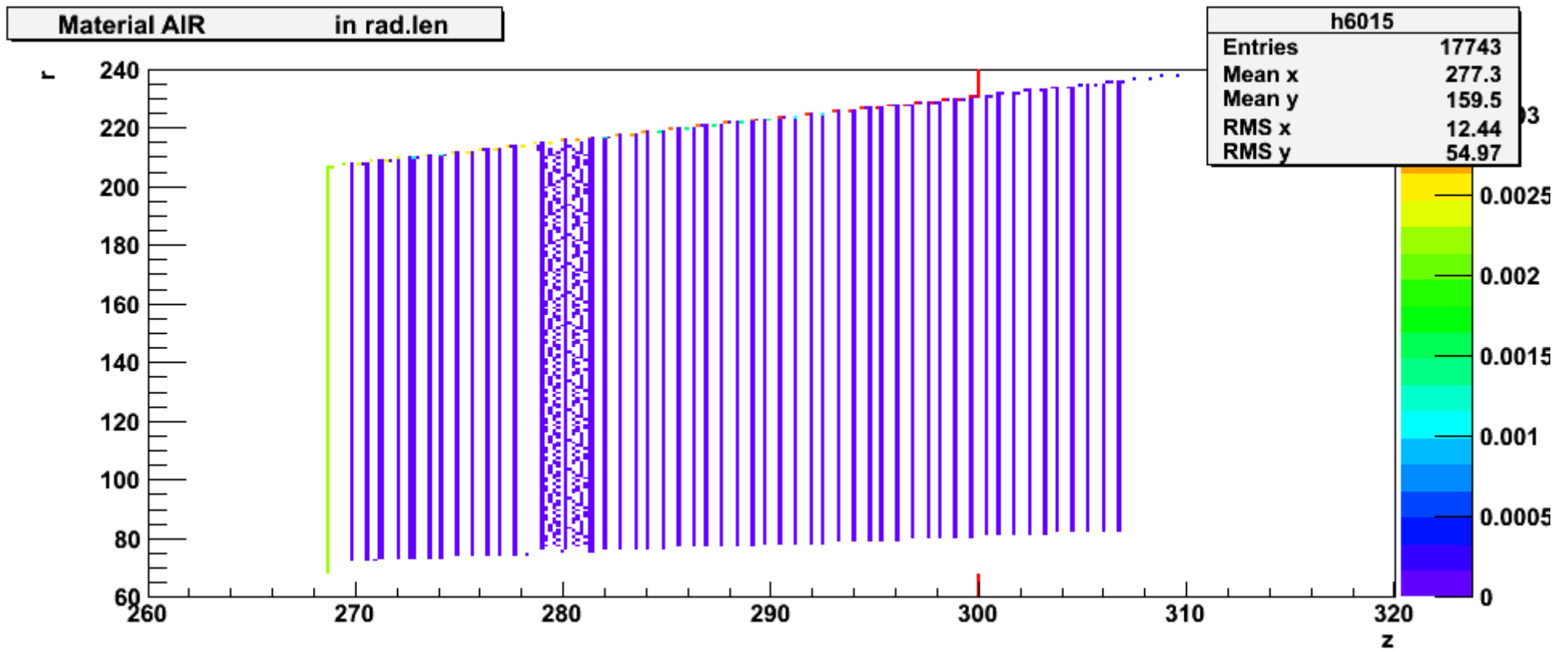


- 1) All 23 lead radiators show up.
- 2) Expect 0.8 radiation lengths
- 3) See 0.8 radiation lengths for each radiator

Material ECAL\_SCINT in rad.len

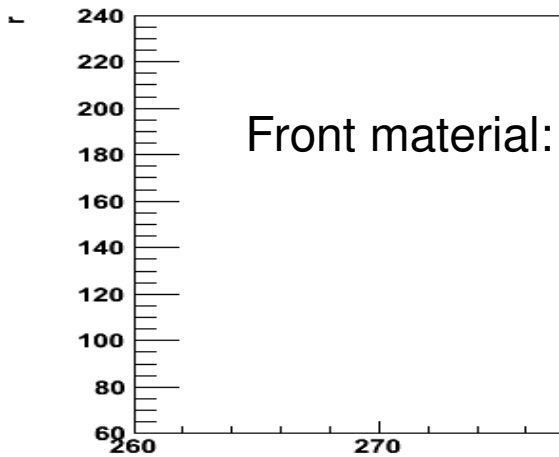


- 1) See all 24 megatiles with ECAL\_SCINT as material
- 2) See two SMD planes
- 3) See correct ratio between preshower and normal tiles  
Question: is postshower thicker? I recall from slow-simu that something is different between postshower and preshower layers.. (thickness? bicron vs kuraray? ... ?)
- 4) Expect and see 0.012 radiation lengths for preshower tiles. Expect 7/5 larger for geantinos passing through 0.7 cm apex-to-base in SMD. Peak rad. len. is about 1.68 as expected.
- 5) Postshower shows correct number of radiation lengths.



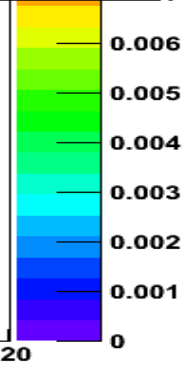
- 1) Air is air
- 2) Air is missing from the spacer layer
- 3) Looks like there are small airgaps between each SMD strip. Also may be some air in places where front/back plastic should be in the SMD plane... Not clear why, because....

Material ECAL\_EFLS in rad.len

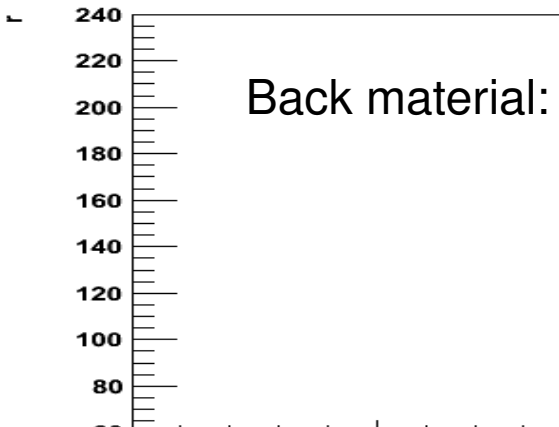


h6034	
Entries	541
Mean x	280.2
Mean y	145.5
RMS x	1.031
RMS y	39.84

Front and back material layers on the SMD planes show up.

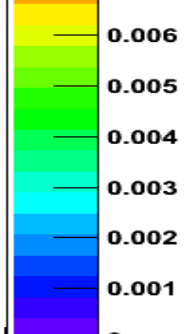


Material ECAL\_EBLS in rad.len

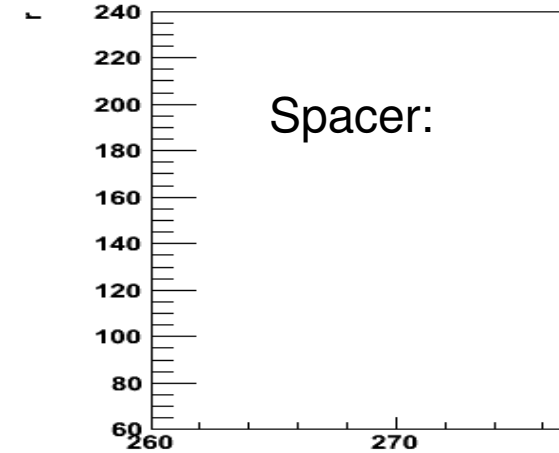


h6033	
Entries	537
Mean x	280.3
Mean y	145.5
RMS x	0.09375
RMS y	39.26

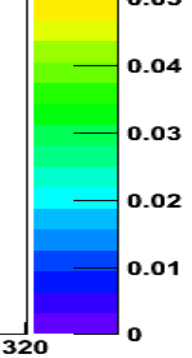
EBLS contains the fiber router layer and the thin Al reinforcement.



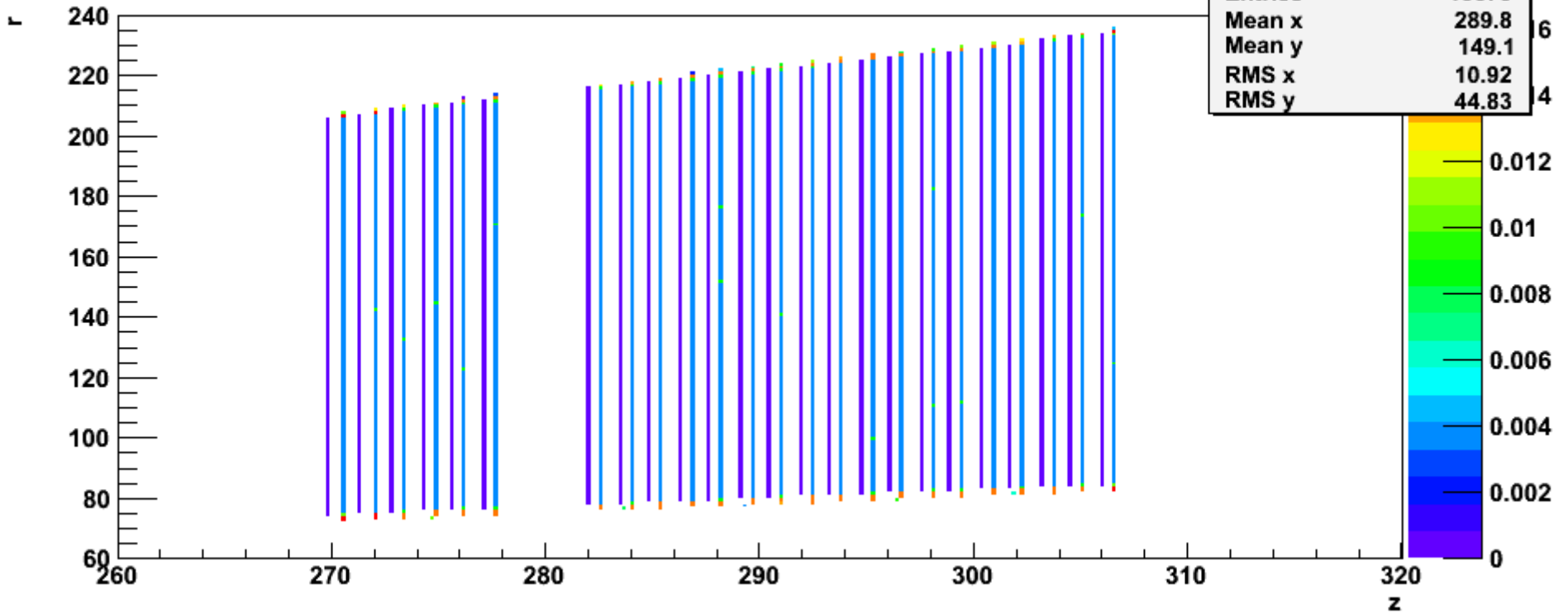
Material ECAL\_PVC in rad.len



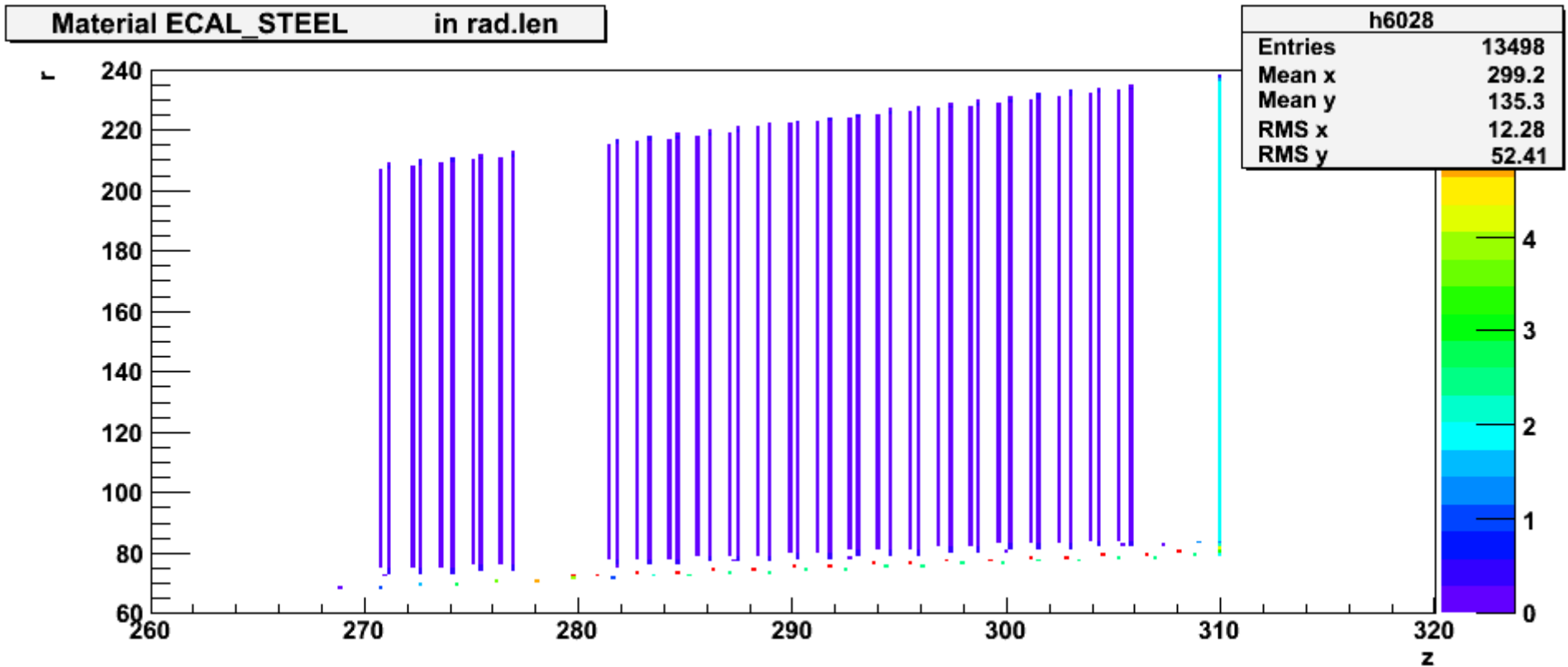
h6026	
Entries	274
Mean x	278.8
Mean y	144
RMS x	8.281e-06
RMS y	39.84



Material POLYSTYREN in rad.len



- 1) Polystyrene layers (i.e. fiber router in each megatile)
- 2) Should be uniform layer to layer.
- 3) Non uniformity due to fraction-of-1-mm shifts to align megatiles and radiators with as-built values.



- 1) Steel cladding shows up around each radiator (23 pairs)
- 2) Scale is misleading here... zooming in on the histogram shows cladding is  $\sim 0.03$  radiation lengths, in line with value expected for 0.5mm of steel
- 3) Back plate shows up, expect and see 1.8 radiation lengths for 3.175 cm of Aluminum (aluminium if you prefer...)

Material ALUMINIUM in rad.len

h6009	
Entries	7026
Mean x	276.3
Mean y	142.3
RMS x	11.28
RMS y	40.76

