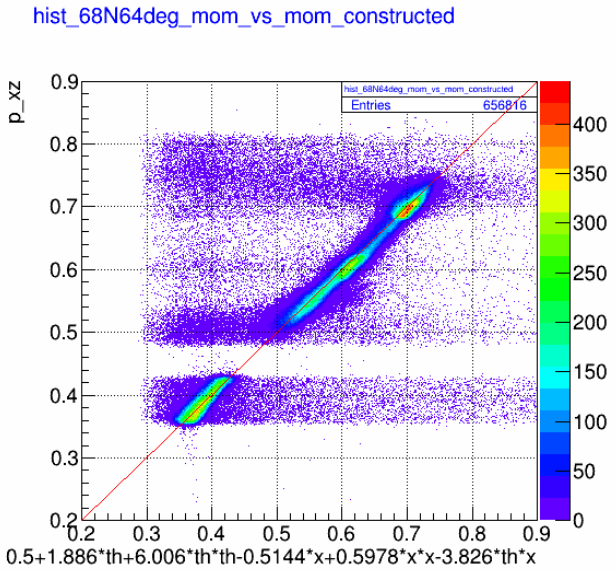
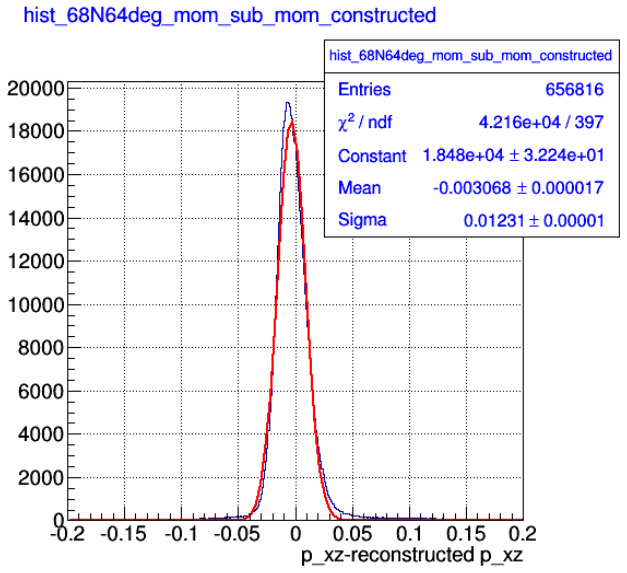
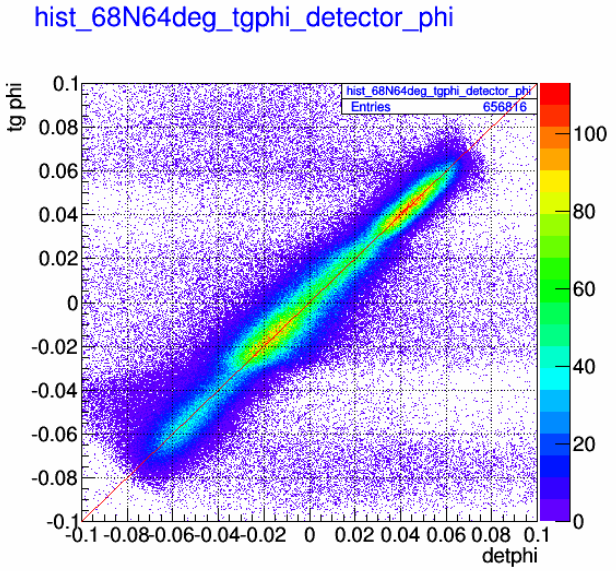
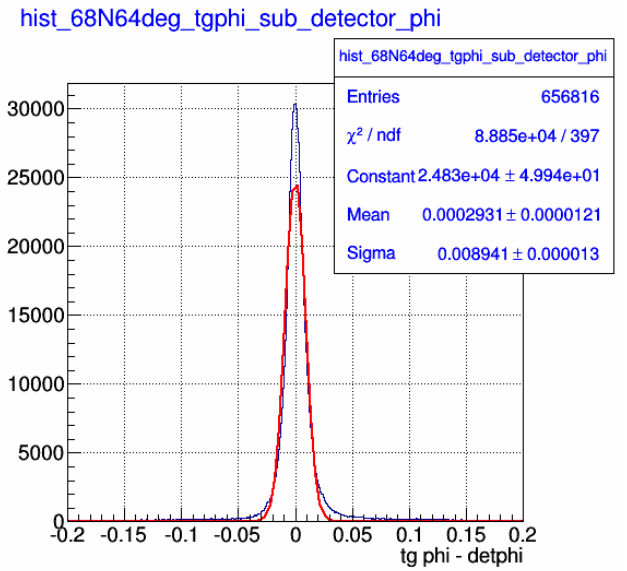
The matrix version.
We can extract the matrix parameter that translate detector (x,theta,phi) into target parameters: momentum,tg_phi, tg_theta.
The results are as follow:
1. p_xz = p_xz(x_det,theta_det)
2. tg_phi = tg_phi(phi_det)
3. tg_theta = tg_theta(x_det,theta_det)

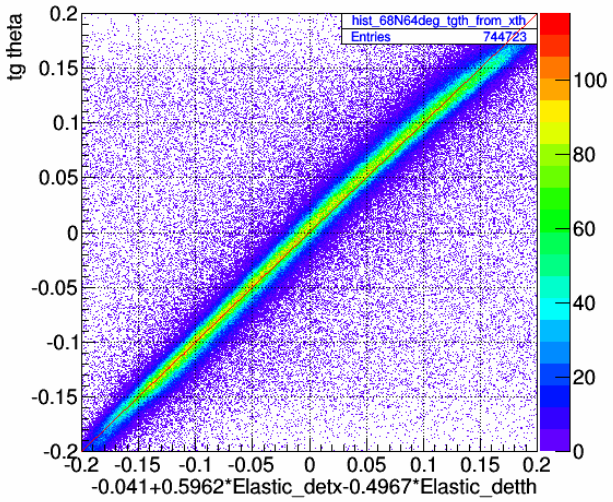


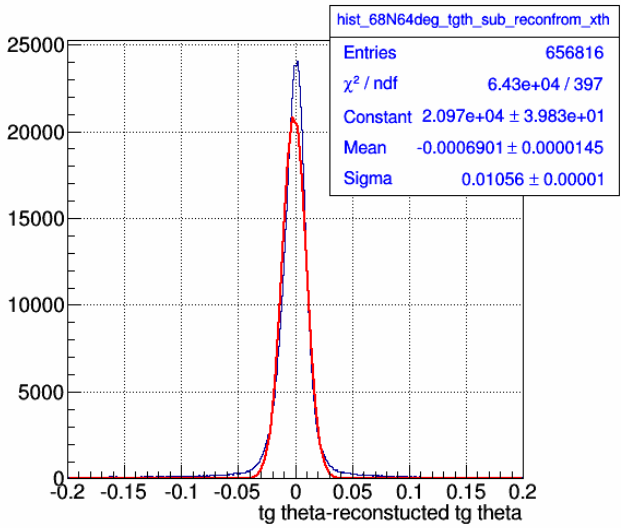


Good for 0.35 to 0.75 GeV/c









tg_theta

In Metrix way, valid for [0.35 to 0.75 GeV/c momentum]

p_xz = 0.5+1.886*detth+6.006*detth*detth-0.5144*detx+0.5978*detx*detx-3.826*detth*detx
(to 2nd order)

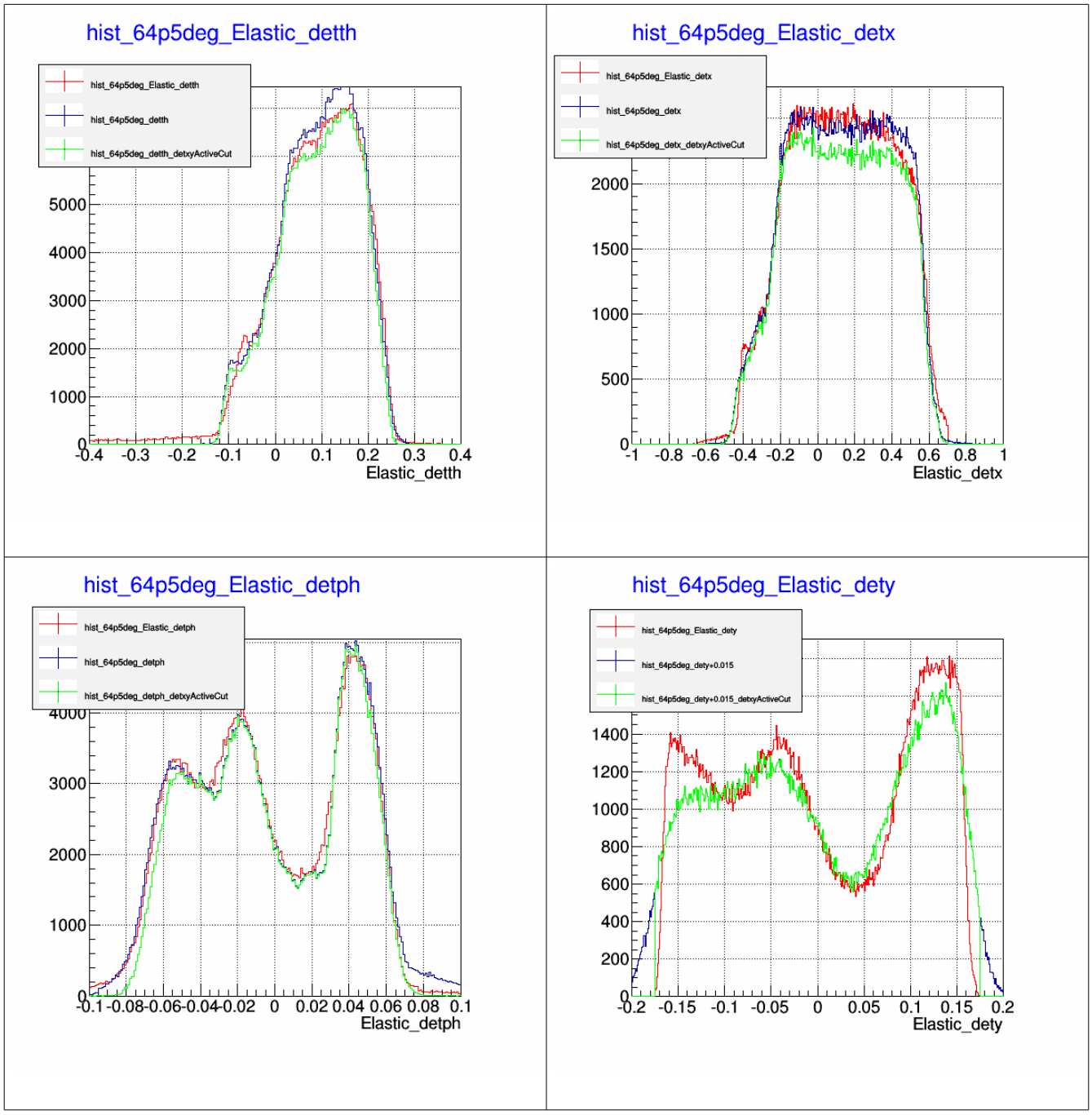
tg_theta = -0.041+0.5962*detx-0.4967*detth
(to 1st order)

tg_phi = detphi
(to 0th order)

|p| = p_xz * sqrt(1+tg_th*2+tg_ph**2)/sqrt(1+tg_th**2)

So when apply the acceptance cut in various mode we have to cut

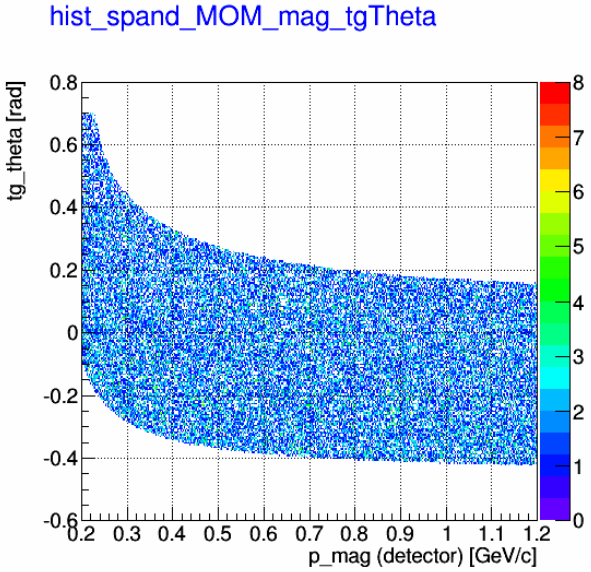
1. |det_x|<= 0.7 and |det_y-offset|<=0.175 according to the active area of MWDC1. Where the offset is due to the mispointing.

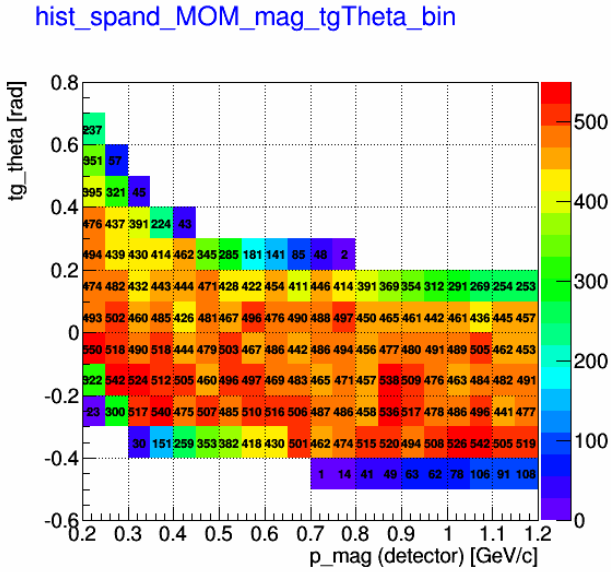


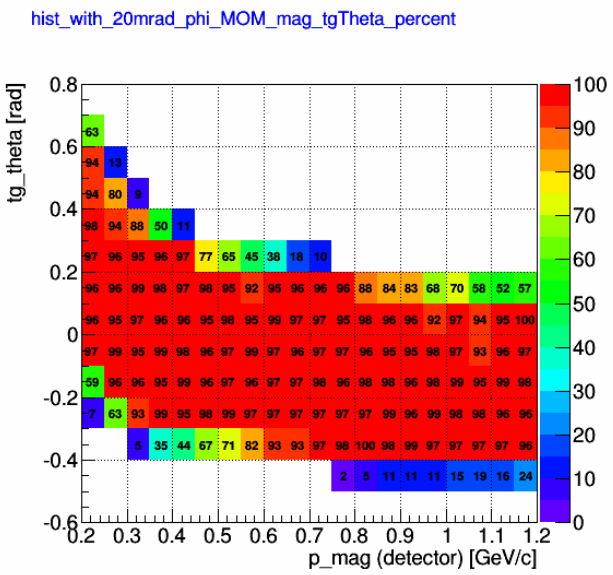
Comparing the elastic (red) to the reconstructed with cut (green), the overall shape are within the same coverage (except for det y). so when making the cut according to det-y, I have to make sure it is not too much cut off.

In overall simulation for production, we have

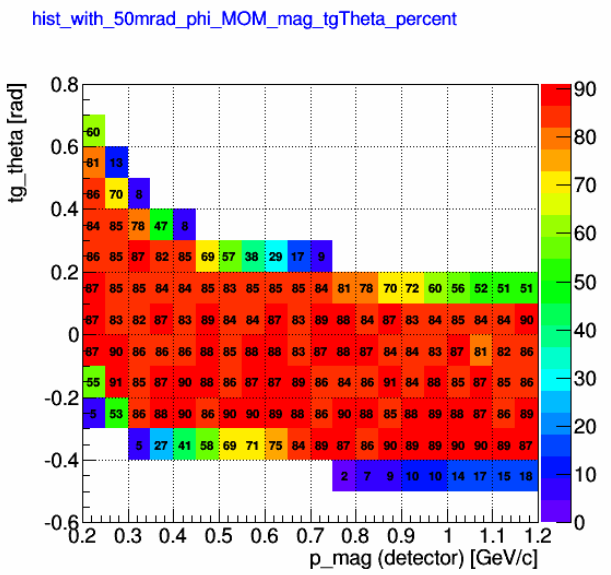
with the cut on the detector acceptance, |det_x|<= 0.7 and |det_y|<=0.175 according to the active area of MWDC1. We have the profile in term of momentum at detector vs tg_angle as follow.







With |tg_phi|<=20 mrad



With |tg_phi|<=50 mrad