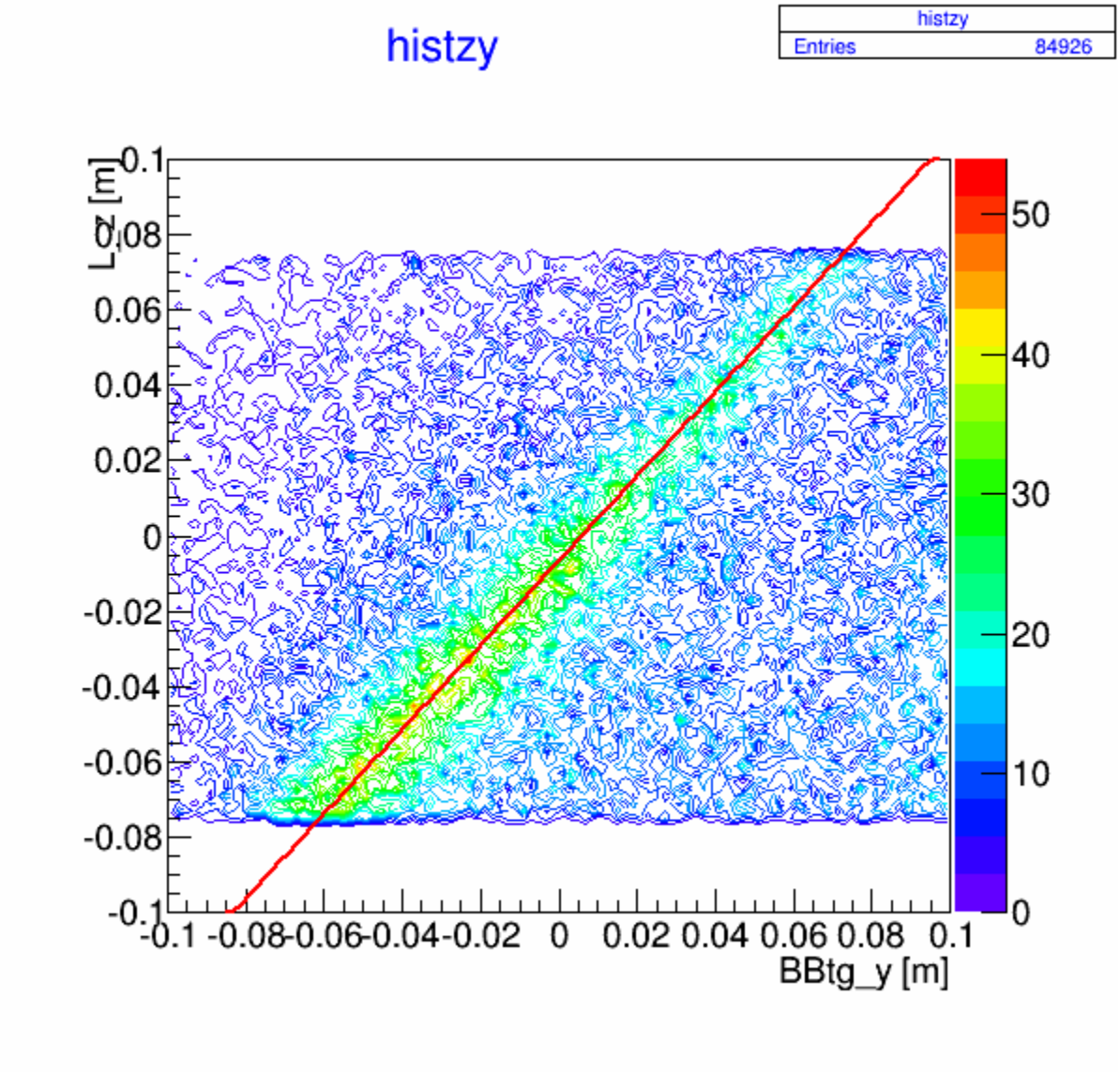
The R_function for BB

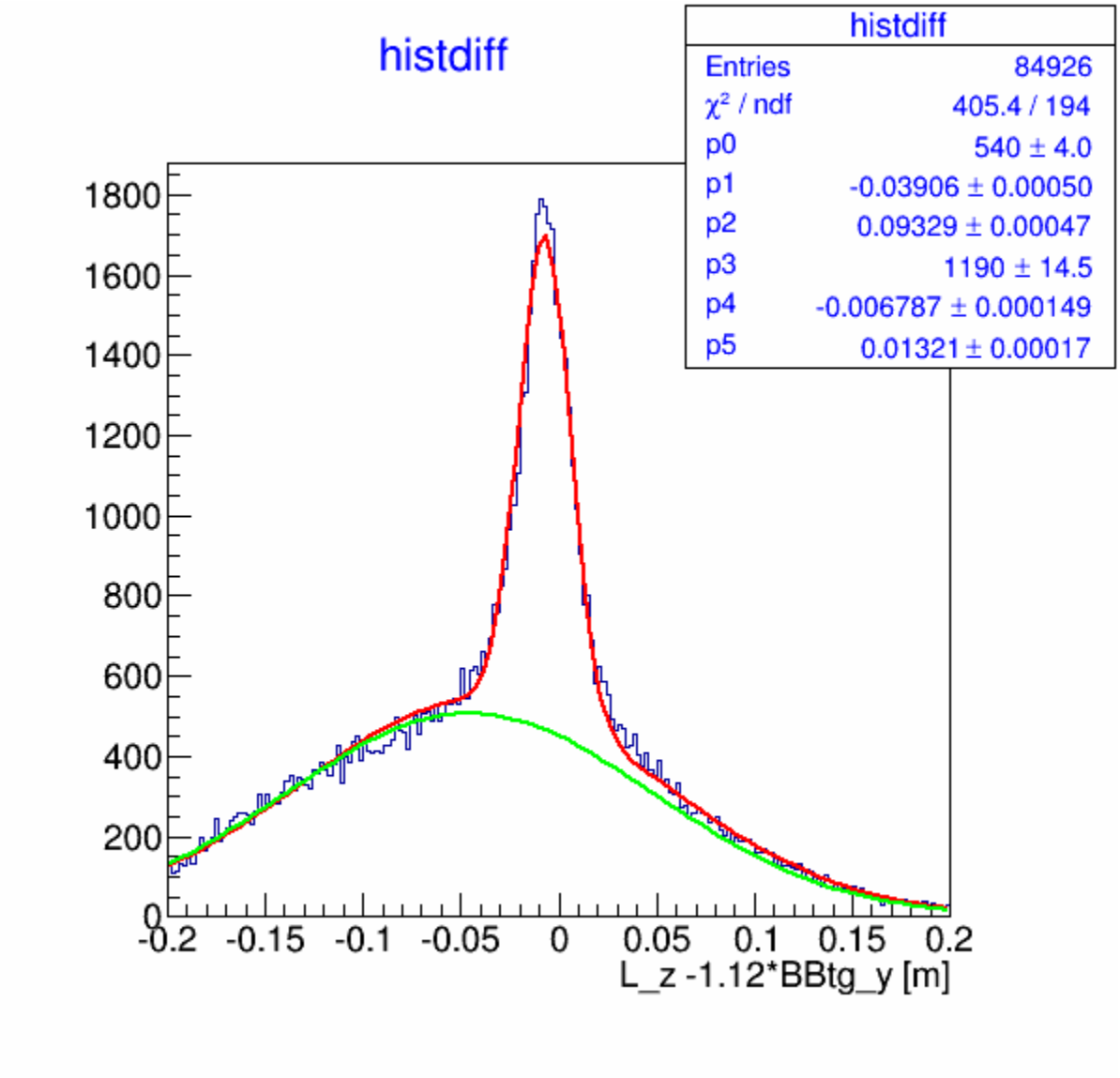
since we do not have the dp I use the actual momentum instead.

Cut data with
1 electron PID
2 vertex cut |z|<=0.08 m and
3. proton PID
4. add CT time
5. add the estimated coincidence vertex

To get estimated coincidence vertex, consider the data with electron PID,vertex cut |z|<=0.08 m,proton PID, and CT time.
The coincidence vertex are with rpl.z = 1.12*BB.tr.tg_y-0.007



A1: Lz vs Bbtg_y fit with function rpl.z = 1.12*BB.tr.tg_y-0.007



A2: Coincidence vertex: L_z-1.12*Bbtg_y

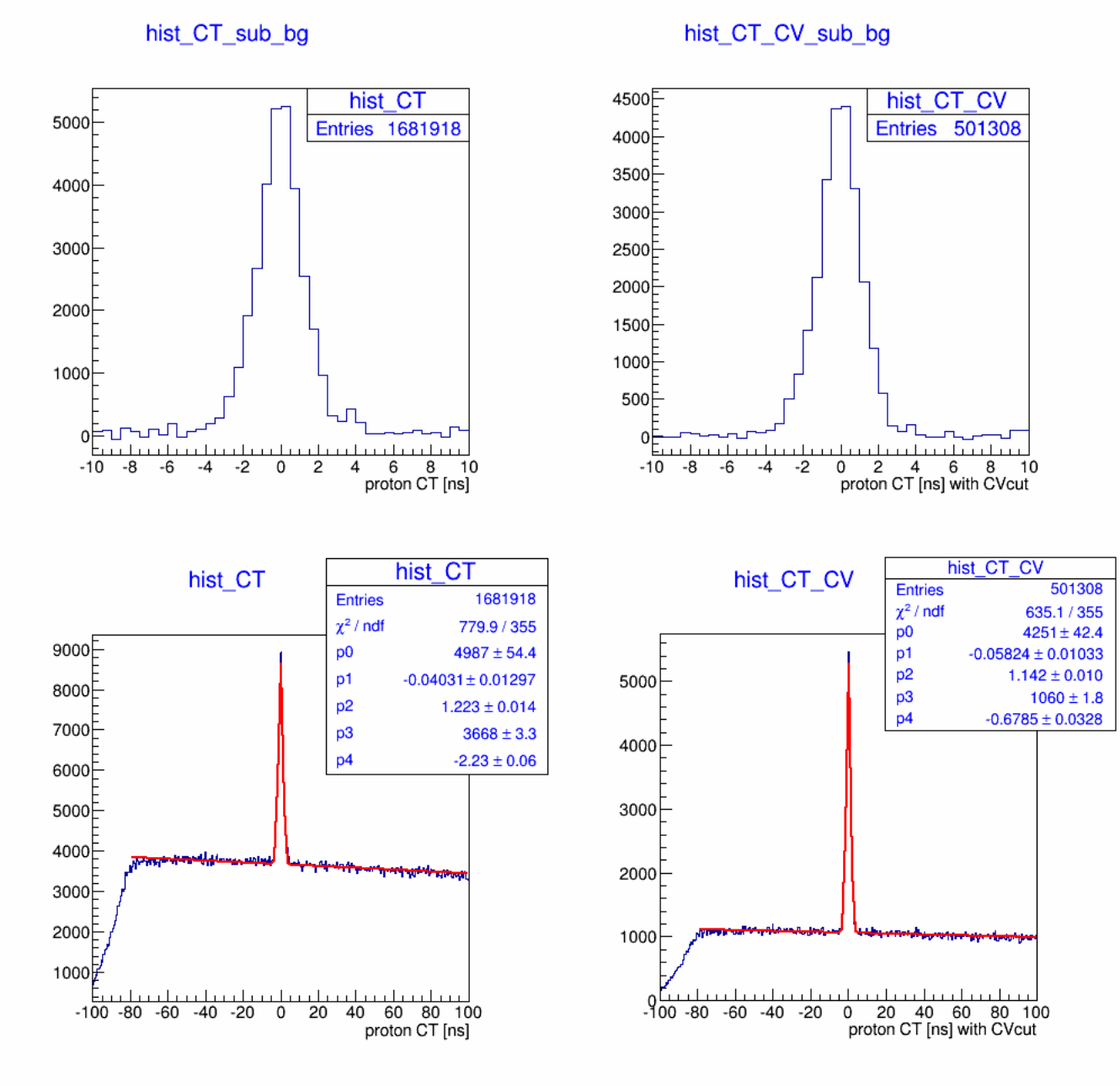
Fit with gaus peak(p3,p4,p5) on gaus background (p0,p1,p2).

The estimated coincidence vertex cut is | Lz-BBy*1.12 +0.007|<=3*0.01321 = 0.040 [m].

The entries under the mean +/- 3*sigma of

the peak with background = 53793 entries. (+/- 232 entries)

the peak sub background = 23029 entries (+/- 152 +/-175 entries).



A3: the result in the CT how much background got eliminate with additional cut on CV.

The CT is fit with gaus peak (p0,p1,p2) on linear background (p3,p4).

Left: original CT with path-length correction for proton.

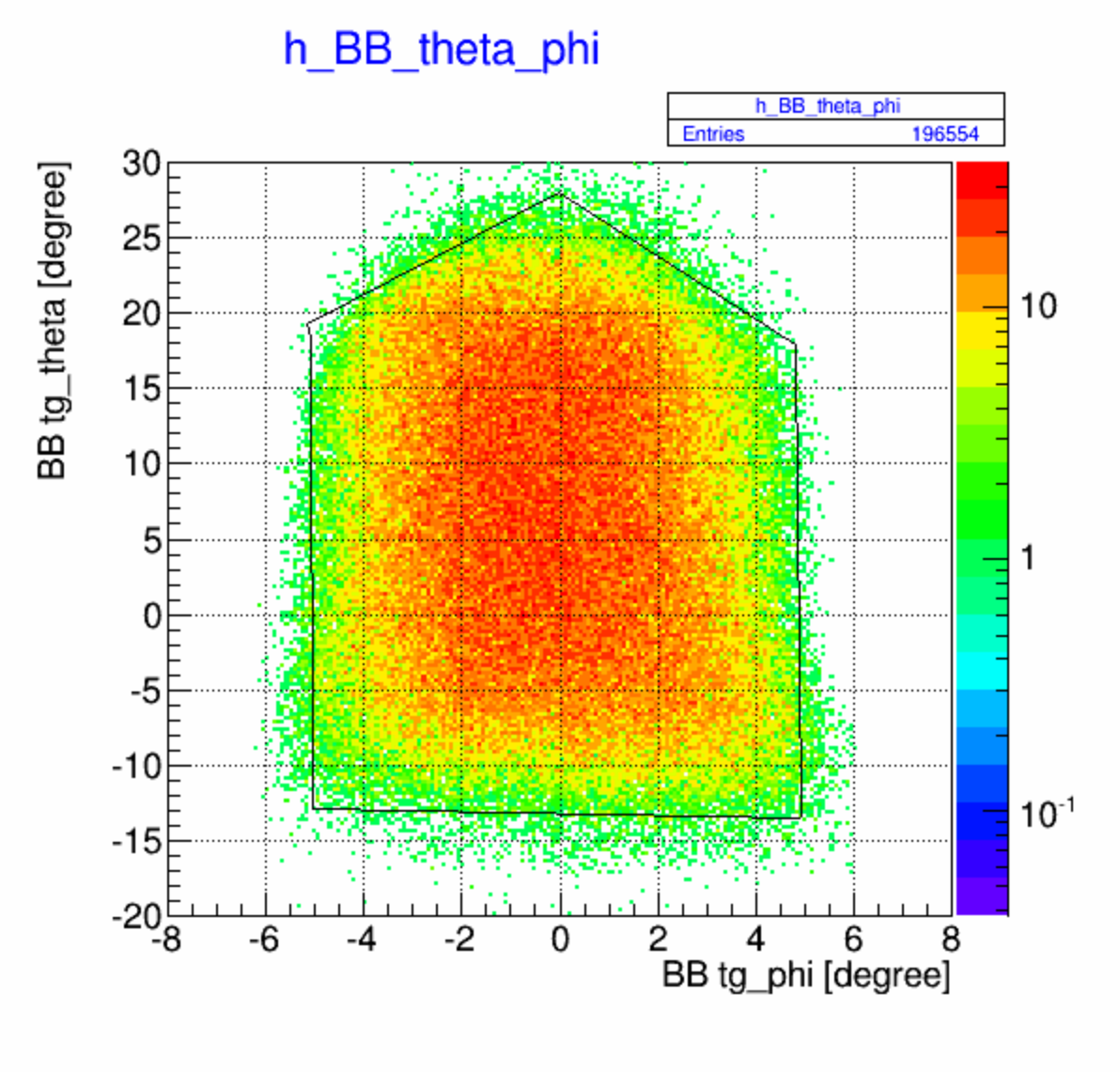
Right: additional requirement on the coincidence vertex (eliminate more background)
|Lz-Bby*1.12+0.007|<=0.04[m].

The background level reduce by >~3 times.

he events under the peak sub background within 3*sigma are:

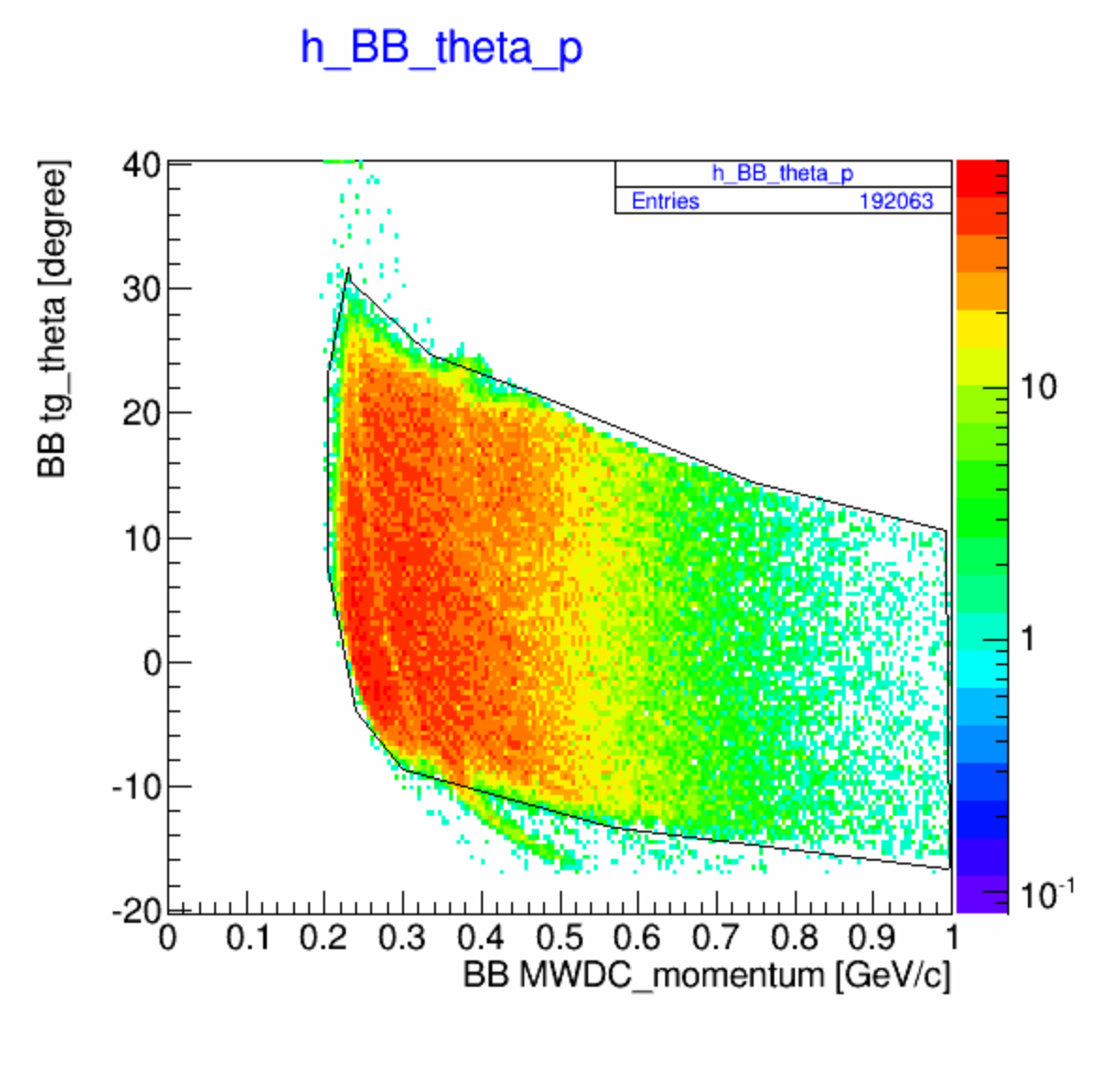
	Entries with bg	Stat.	Entries sub bg	Stat.
hist_CT_proton	90146	+/-300.2	31456.6	+/-177.4 +/-242.3 bg
with |Lz-Bby*1.12+0.007|<=0.04	39429	+/-198.6	24591.1	+/-156.8 +/- 121.8 bg
with |Lz-Bby*1.12+0.007|<=0.05	45633	+/-213.6	25963.3	+/-161.1 +/- 140.2 bg
with |Lz-Bby*1.12+0.007|<=0.06	50152	+/-223.9	26858.6	+/-163.9 +/-152.6 bg

With all selection above, we have



A4: theta vs phi have quit clear edge of the distribution.

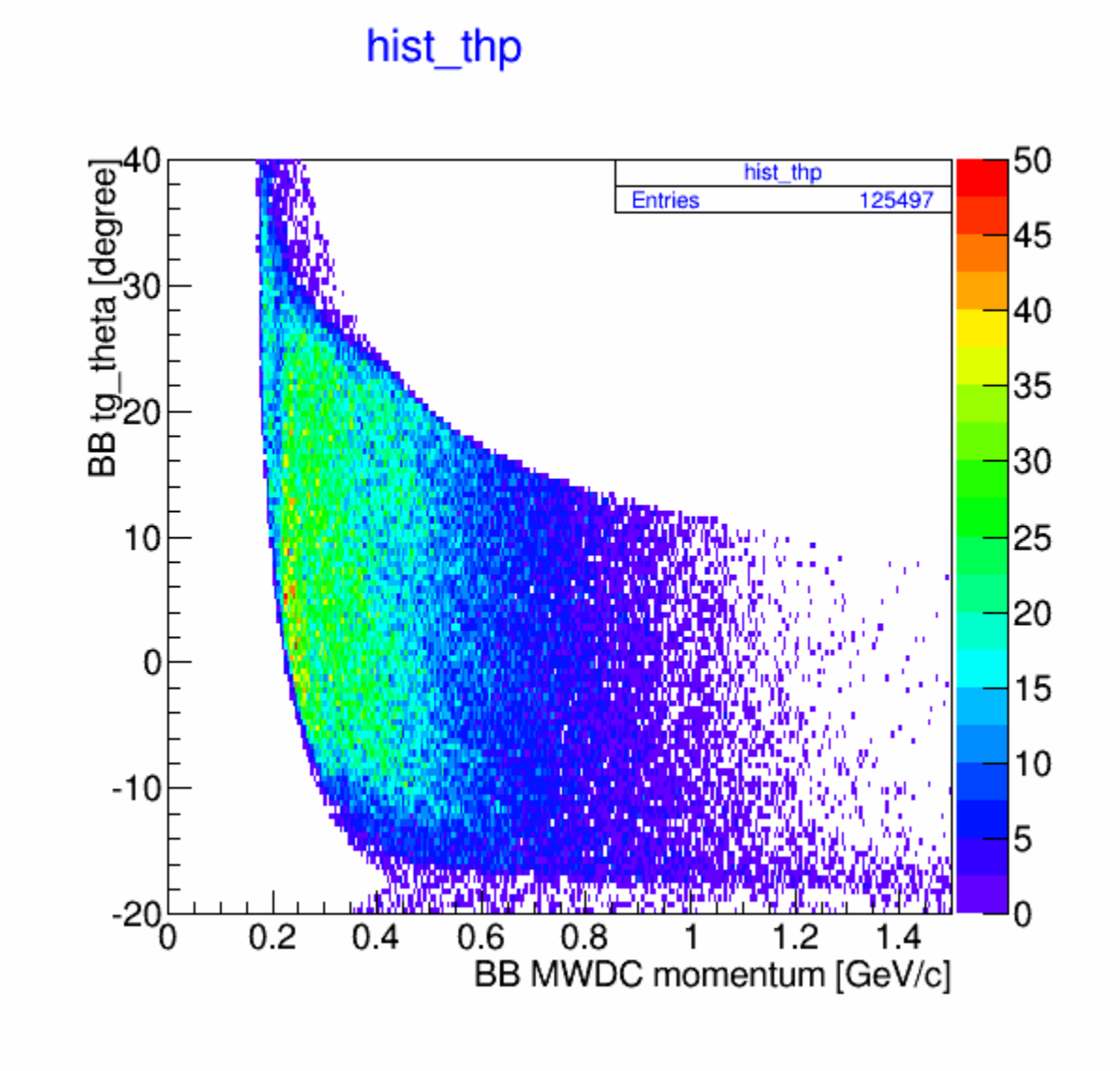
However, when look in the theta vs momentum we have some rough edges and tail coming out.



A5: BB theta vs momentum

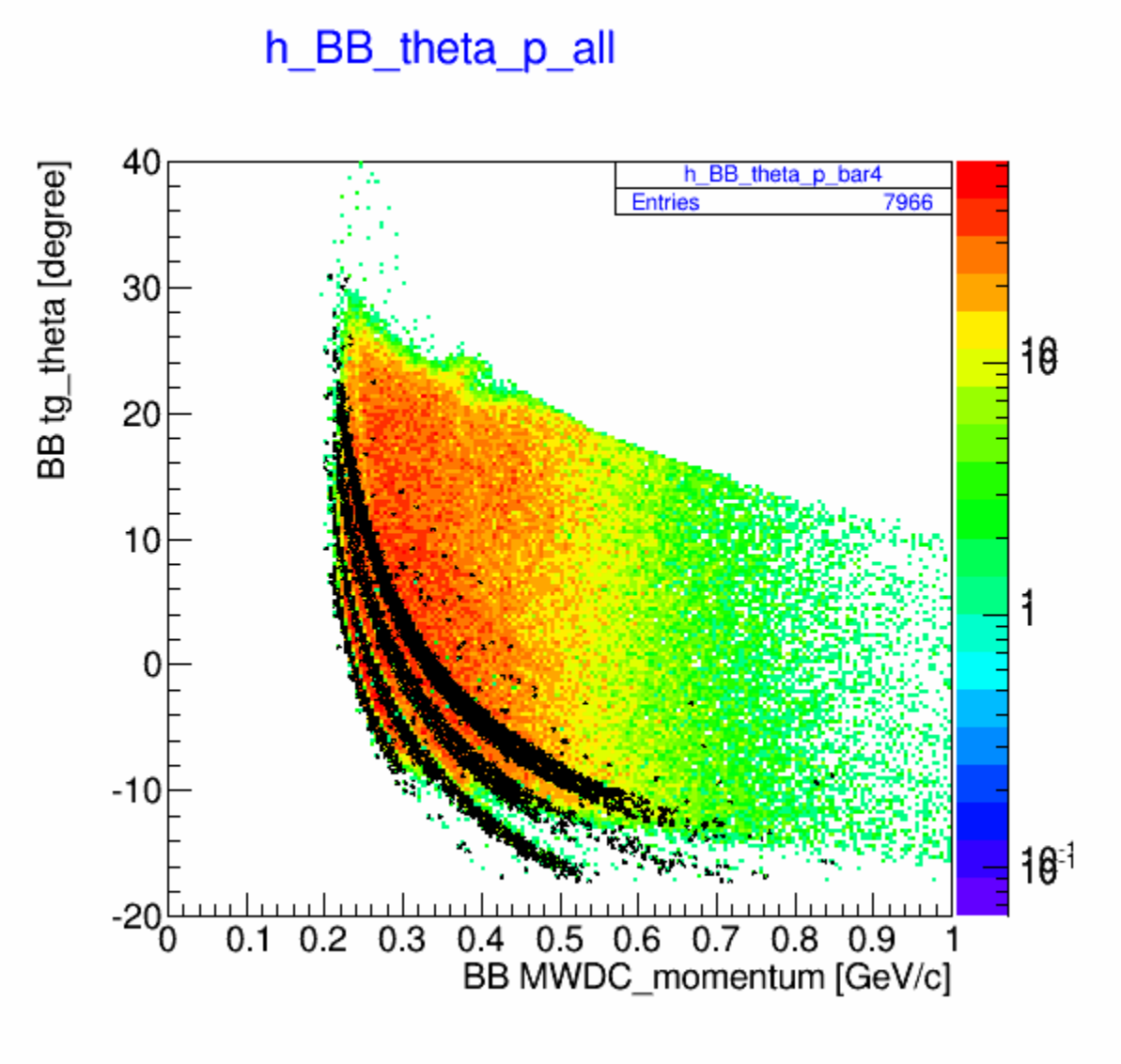
*The extended at 0.4 GeV/c coming from the fullhit data portion. with CT cut
*The faint line around 0.3 GeV/c is also from the fullhit data

The distribution of theta vs momentum is ideally have smooth edge. This can be seen when I do not include the proton PID.



A5: BB theta vs momentum (without proton PID)

That mean somehow the PID effect the distribution of theta vs momentum.



A6: BB theta vs momentum with bar ID alternate in color/black.
The composition from bar to bar is alternately in color and in black, 6 bar in overall. The 0^{th} bar is on the other edge lowest momentum.

The proton PID I use are from E vs p.