Full vs Low Magnetic Field

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Supervisor:
Dr. Vadim Kolesnikov
Dra. Ivonne Maldonado
Dr. Viktar Kireyeu
Dra. Natalia Kolomoyets

Márquez Ramírez Juan Carlos
juan.marquezra@gmail.com

On the last session

- Comparative of Full and Low Magnetic Field.
- Make a cut on Vertex Position.
- Make a cut on DCA Global.
- Make a cut on Pseudo-Rapidity.

In this session

- Comparative of the new cuts on Full and Low Magnetic Field.
- See what happened with the primary vertex position.

Let's remember

The system we are studying is Request 25, that is, reduced magnetic field. We will compare it with full magnetic field, that is, Request 28.

	Request 28	Request 25
Collision system	Bi + Bi @9.2GeV	Bi + Bi @9.2GeV
Event Generator	UrQMD	UrQMD
Prodcution	5 Million Events	10 Million Events
Magentic Field	5 kG	2 kG

Available resources at ICN cluster

At the Moment

Low Magnetic Field

Variable	Cut
Transverse Momentum	$p_T > 0.15\ (GeV/c)$
Pseudo rapidity	$\eta \in (-1.5, 1.5)$
Number of Hits	$Number\ of\ Hits > 27$
DCA Global	$DCA\ Global > 1\ cm$
Primary Vertex Position	Pending

Full Magnetic Field

Variable	Cut
Transverse Momentum	$p_T > 0.1\ (GeV/c)$
Pseudo rapidity	$\eta \in (-1, 1)$
Number of Hits	$Number\ of\ Hits > 16$
DCA Global	$DCA\ Global > 0.5\ cm$

Numbers of Hits

With cut in Number of Hits
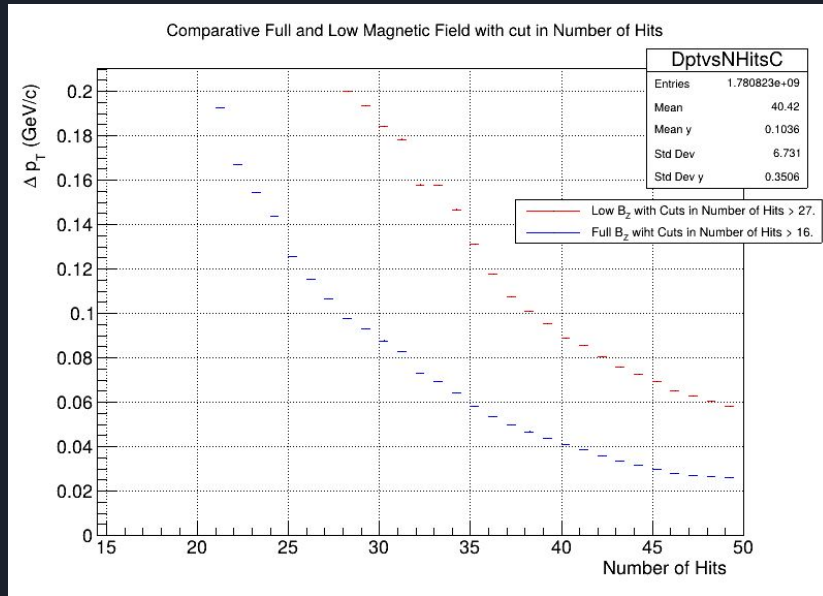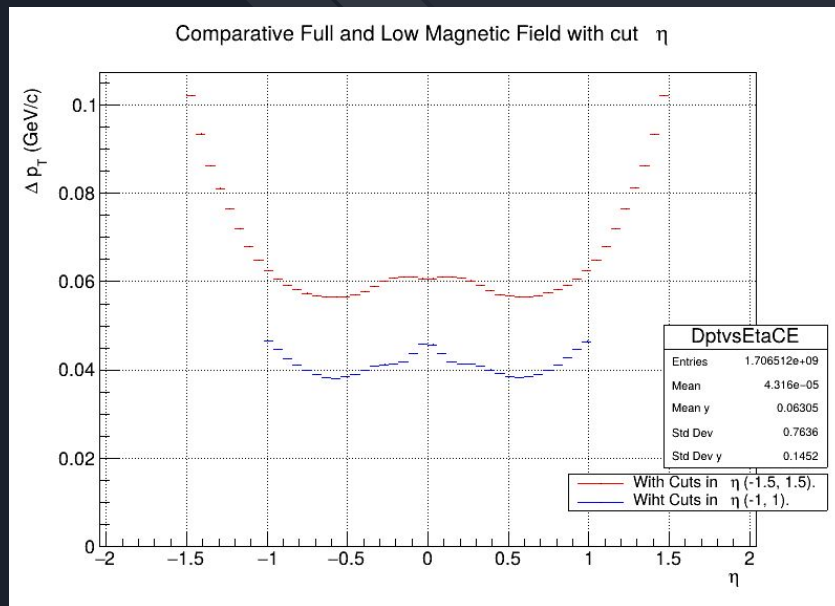
With cut in Pseudo-Rapidity
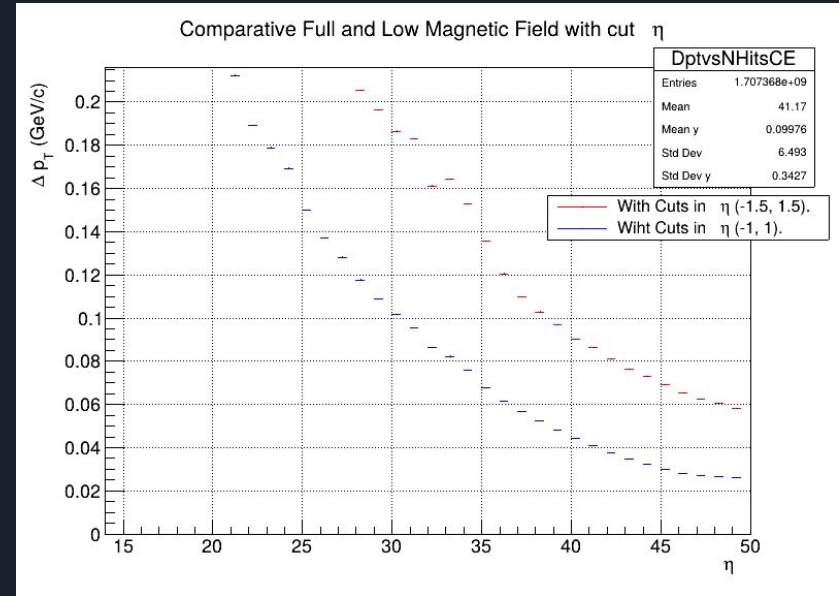
PseudoRapidity

With cut in Number of Hits
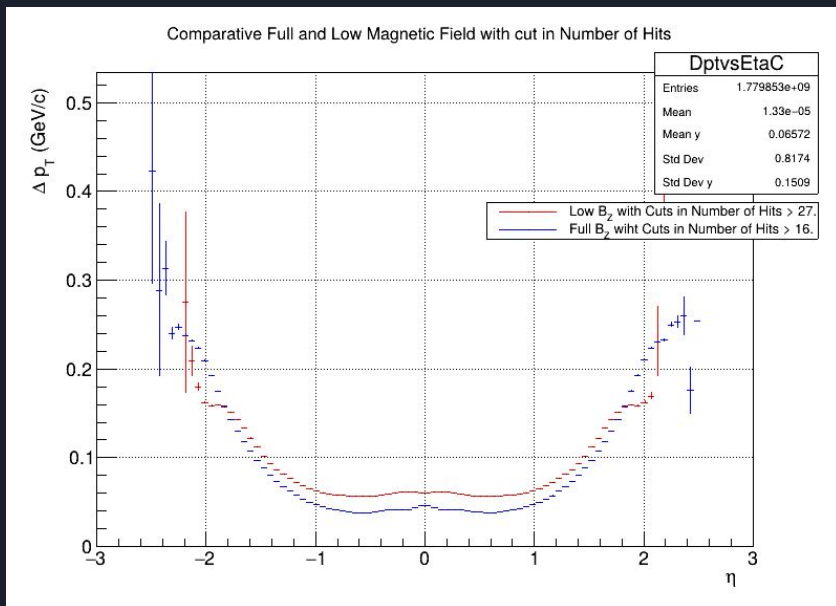
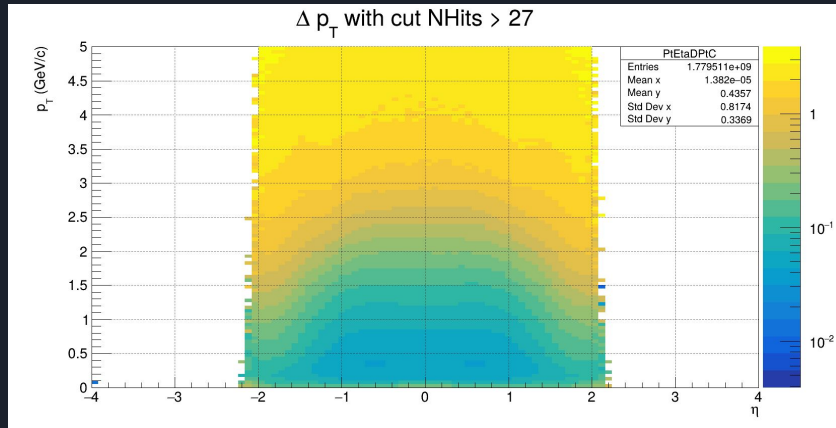## With cut in Pseudo-Rapidity

Momentum Transverse Resolution with cut in the Number of Hits
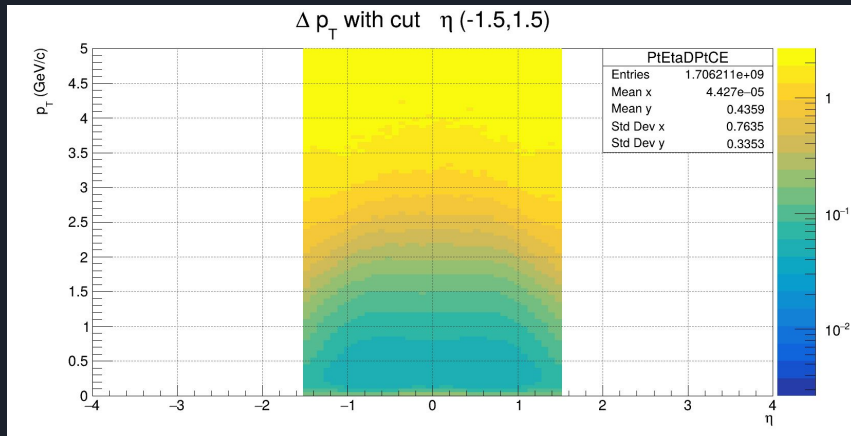
Low Magnetic Field

Δ p_T with cut NHits > 27

PtEtaDPtC	
Entries	1.779511e+09
Mean x	1.382e−05
Mean y	0.4357
Std Dev x	0.8174
Std Dev y	0.3369

Full Magnetic Field

Δ p_T with cut NHits > 16

PtEtaDPtC	
Entries	7.485993e+08
Mean x	−8.213e−05
Mean y	0.4428
Std Dev x	0.8884
Std Dev y	0.3316

Momentum Transverse Resolution with cut in the Pseudo-Rapidity
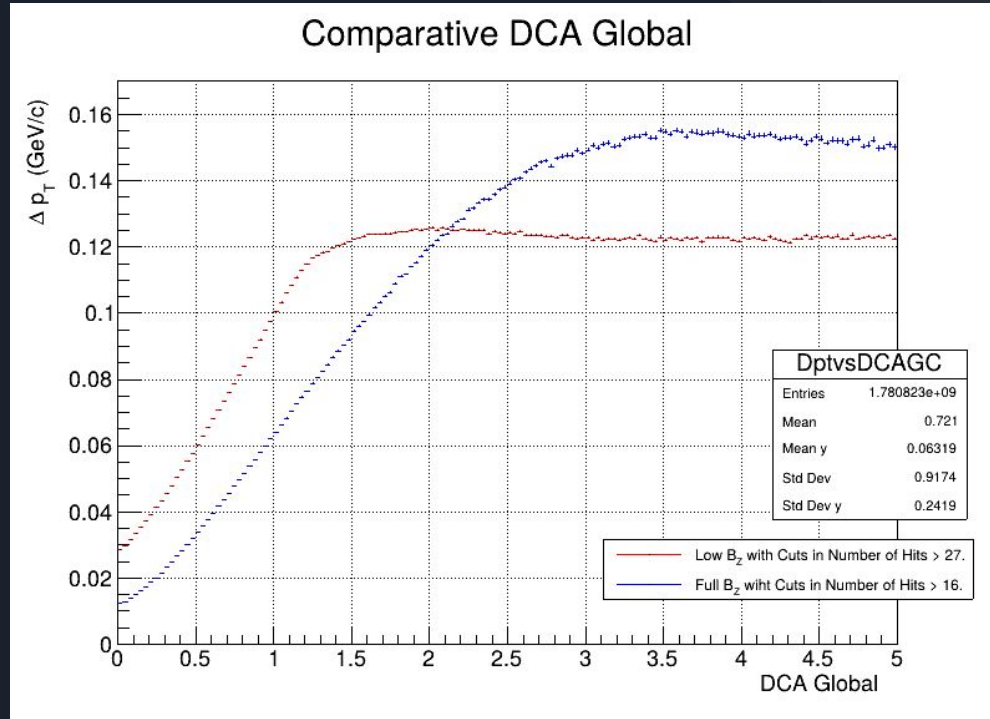
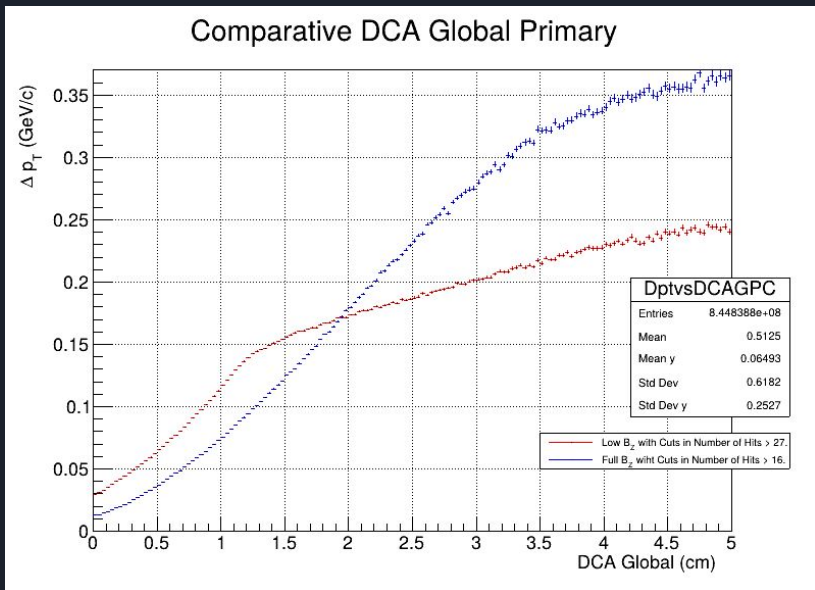## Low Magnetic Field

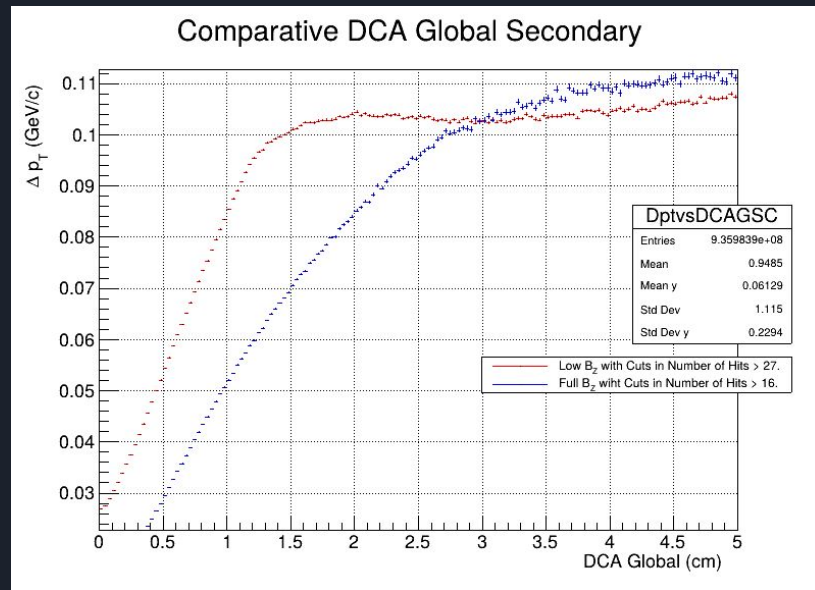## Full Magnetic Field
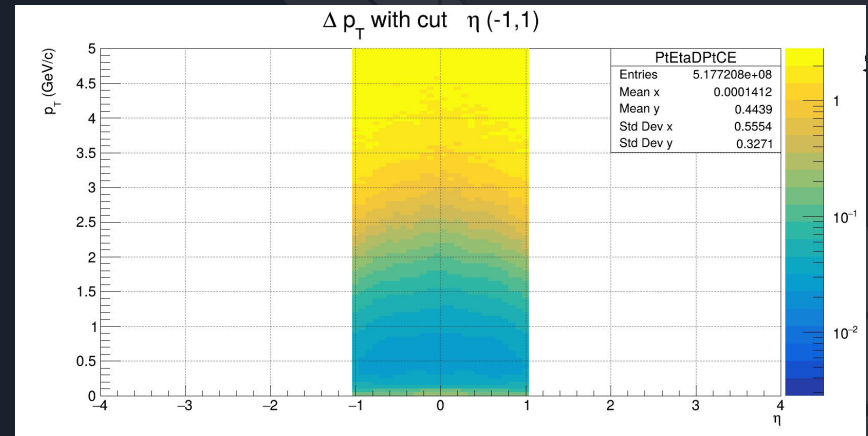
TProfile of DCA Global All

TProfile of DCA Global
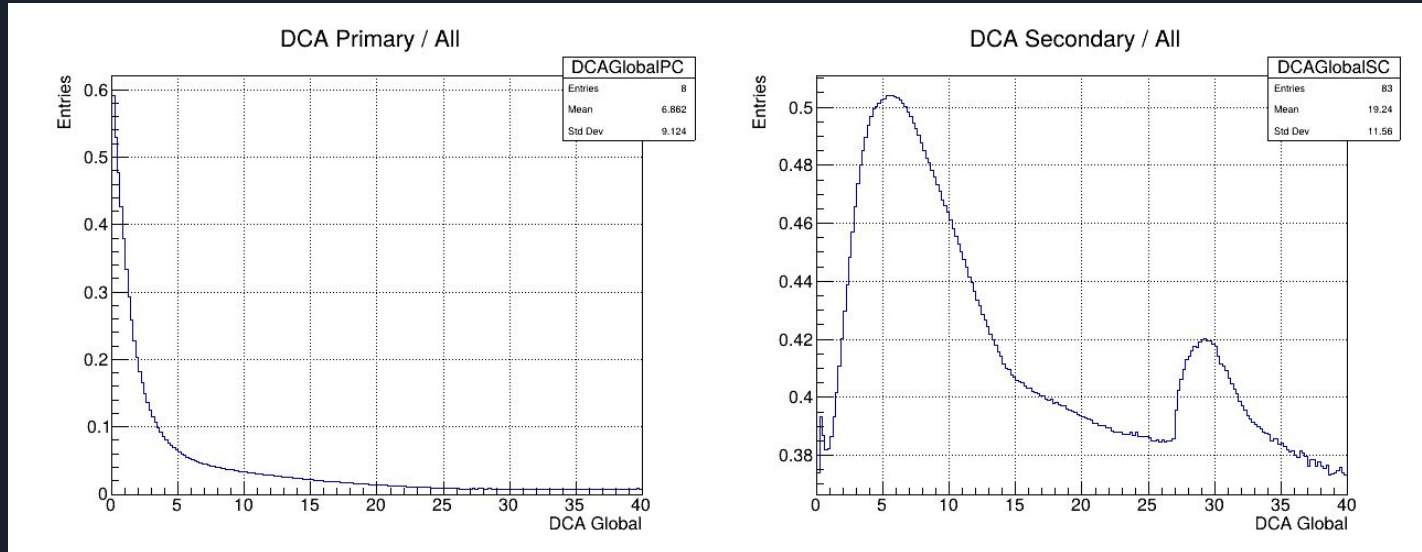
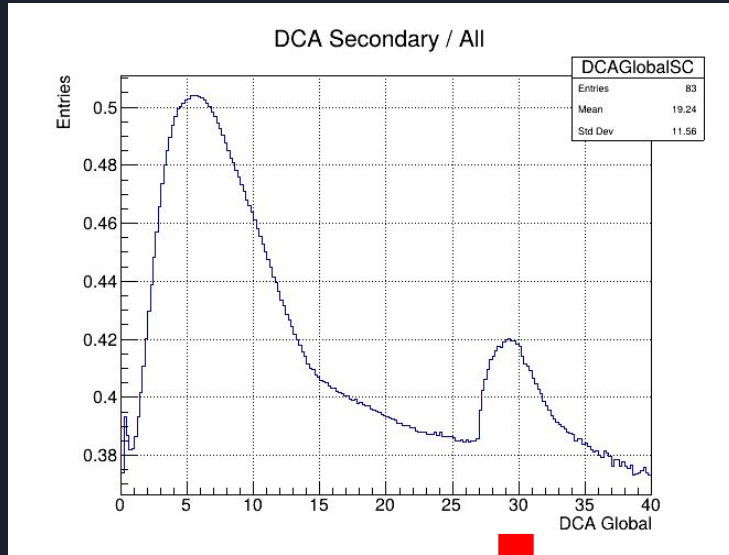## Primary Particles

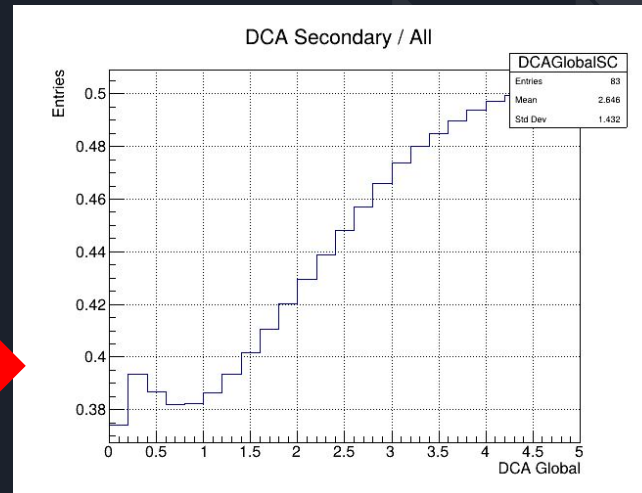## Secondary Particles

Cut on the DCA Global

In the last session it was mentioned that the cut in DCA could be between 2 and 2.5 cm. We did the following to check where a good cut could be.

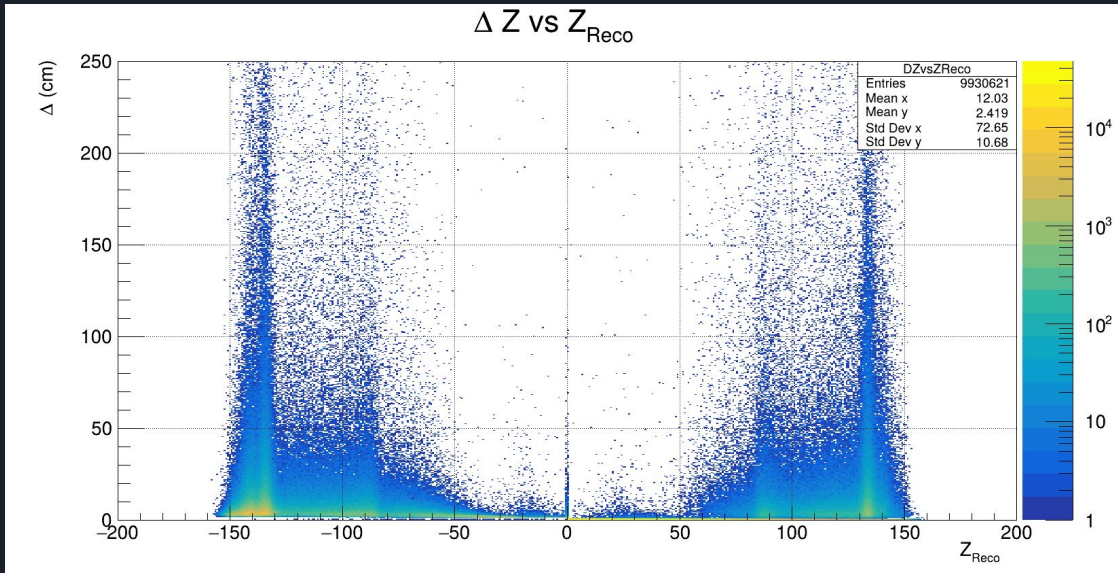We review more calmly the division of secondary particles among all.

If we cut in the previous range, a large percentage of waste particles will remain. This ensures that we can cut in 1 cm
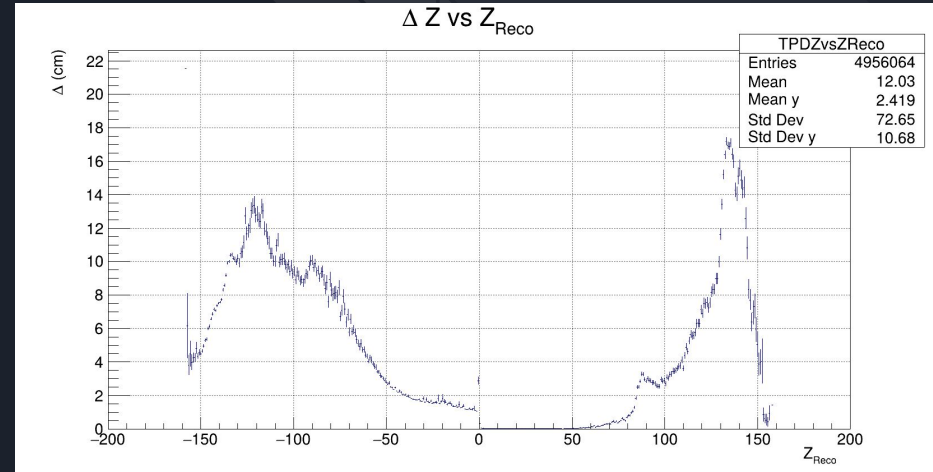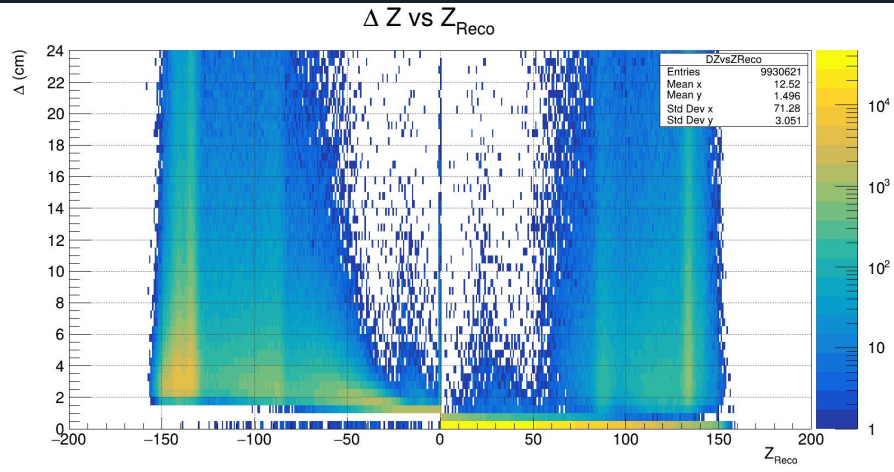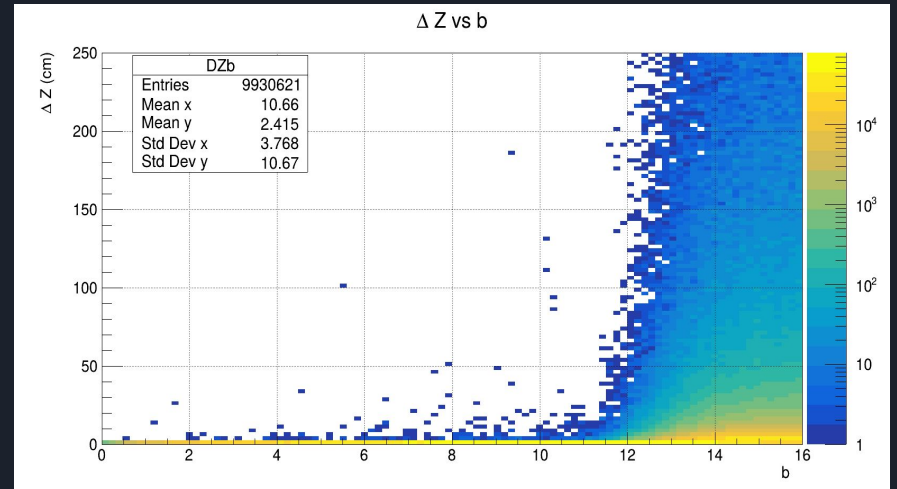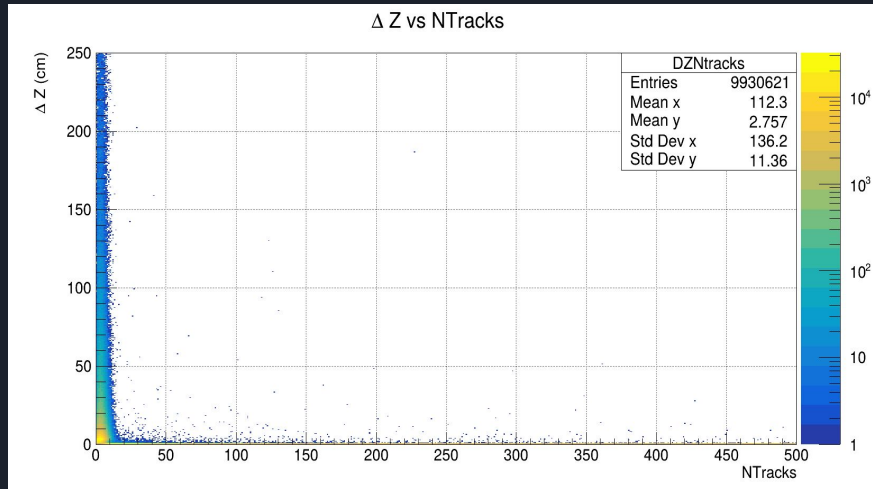
Cut on the Vertex Position

I made the plot the resolution of the primary vertex against the primary vertex on the z-axis, but I see something weird.
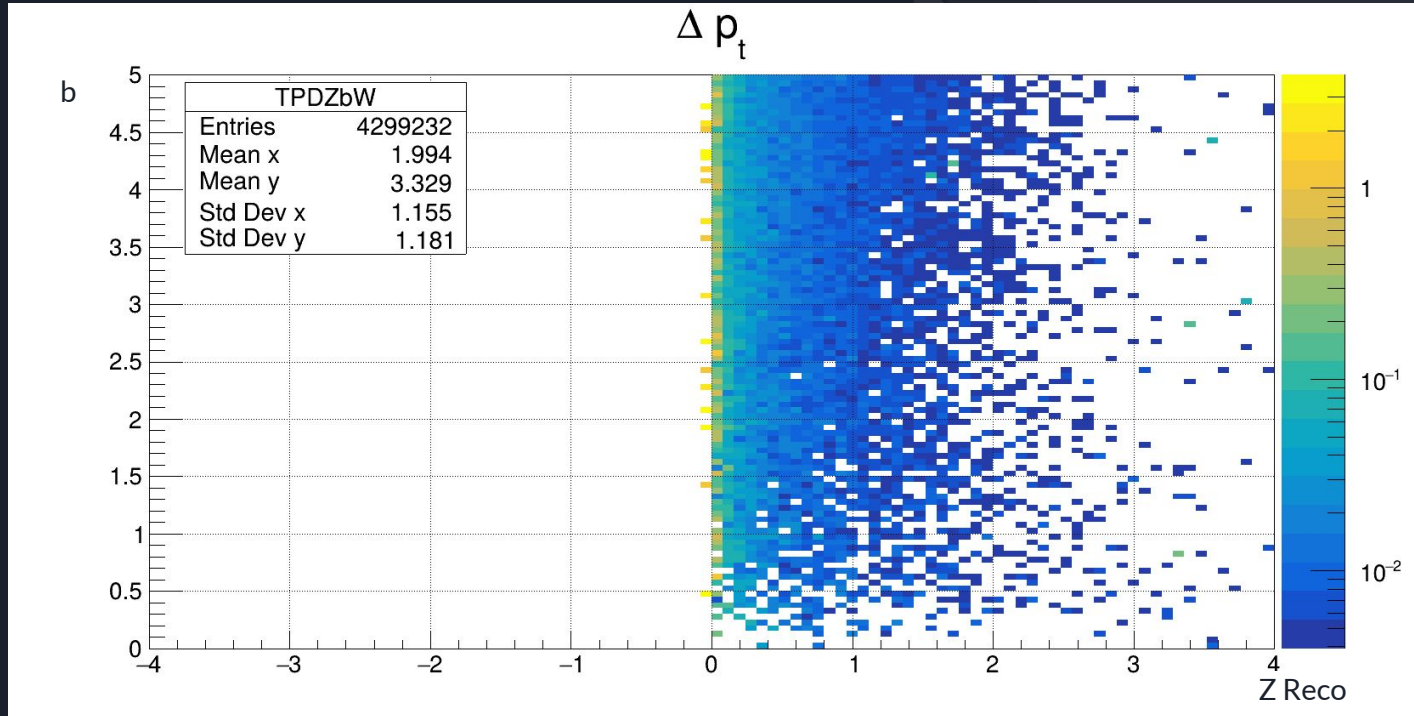
Made a zoom, en 0 to the negative range in ZReco is empty and I made the TProfile of this.

I made the plot the resolution of the primary vertex against the Number of Tracks and Impact Parameter but everything see normal.

I made the TProfile2D of the primary vertex against the Impact
Parameter

Error

The error was the resolution definition of the primary vertex
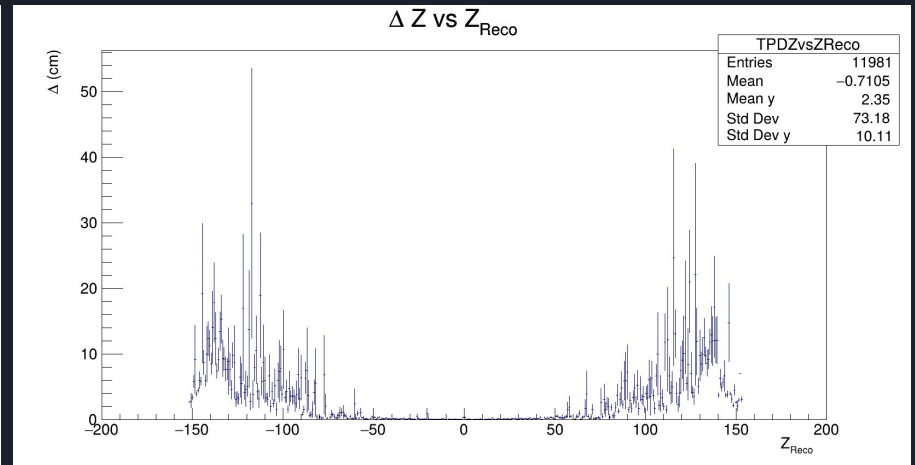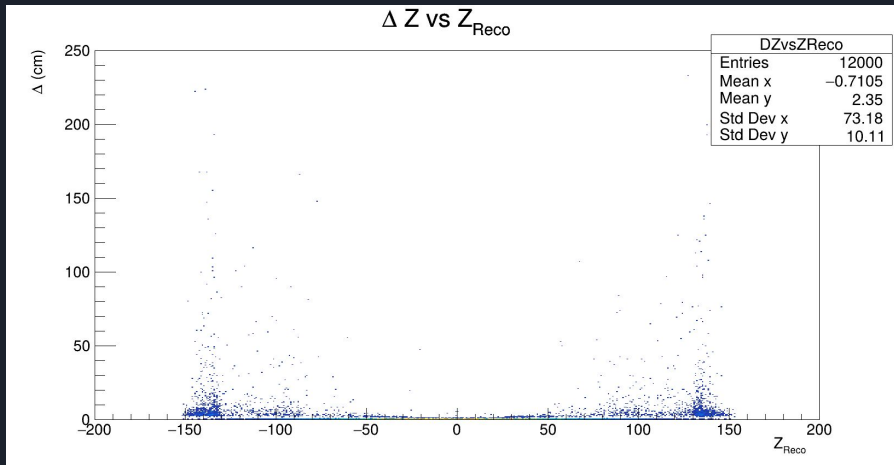
I was using:

$$\Delta Z = \frac{|Z_{reco} - Z_{MC}|}{Z_{MC}}$$

But the correct is:

$$\Delta Z = |\frac{Z_{reco} - Z_{MC}}{Z_{MC}}|$$

17

Correction

Again, I made the plot the resolution of the primary vertex against the primary vertex on the z-axis. Now, we can see, that we have symmetry.

Summary

- Comparative of the new cuts on Full and Low Magnetic Field.
- See a new cut in DCA Global
- See what happened with the primary vertex position.

The Nexts Steps

- Now, already know what is happening with the primary vertices.
- Make a Cut in Vertex Primary.
- Check that all cuts made so far are correct.