

Monte Carlo production: request 25 (general-purpose)

General information:

Event generator: *UrQMD*

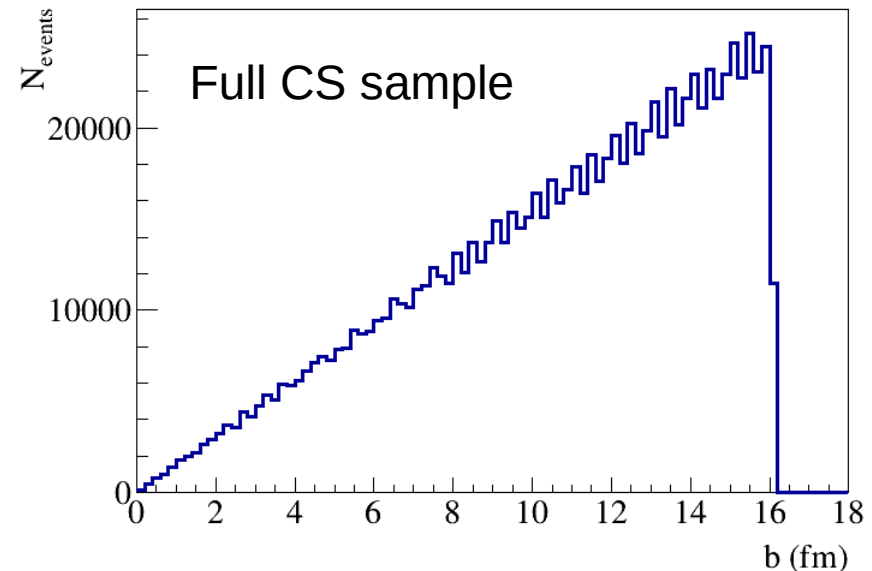
Transport: *Geant4*

Impact parameter range: $0 - 16 \text{ fm (mb)}$

Colliding system: $^{209}\text{Bi} + ^{209}\text{Bi}$

Energy: 9.2 GeV

Centrality studies (**CS**) sample has 10^6 events. Centrality definition requires only half of that amount.



CS sample is available at NICA cluster:

</eos/nica/mpd/sim/data/exp/dst-BiBi-09.2GeV-mp07-22-500ev-req25cs/BiBi/09.2GeV-mb/urqmd/BiBi-09.2GeV-mp07-22-500ev-req25/>

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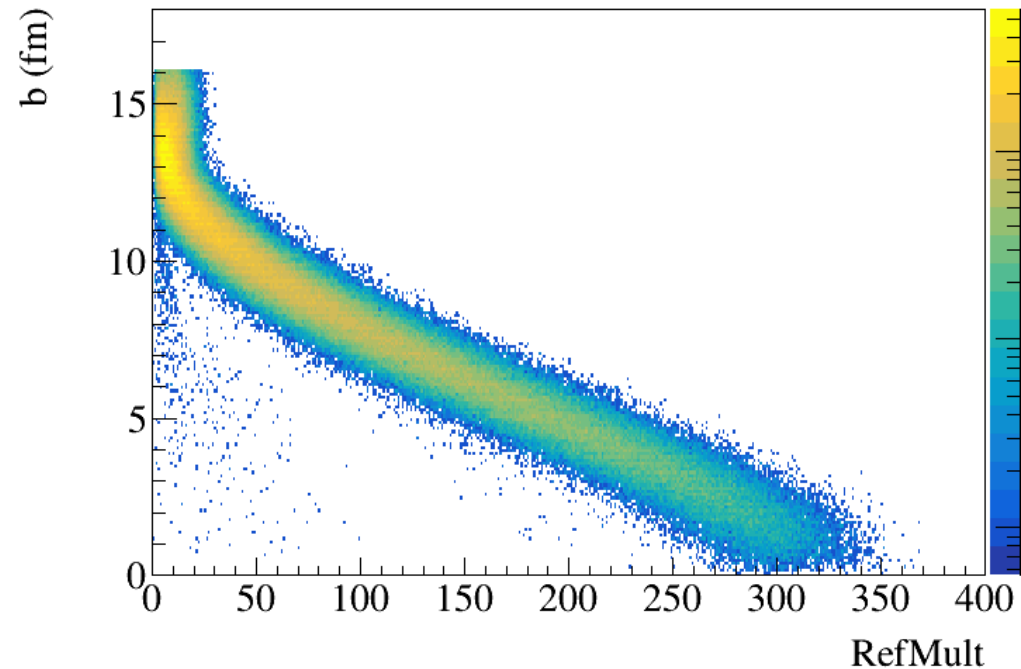
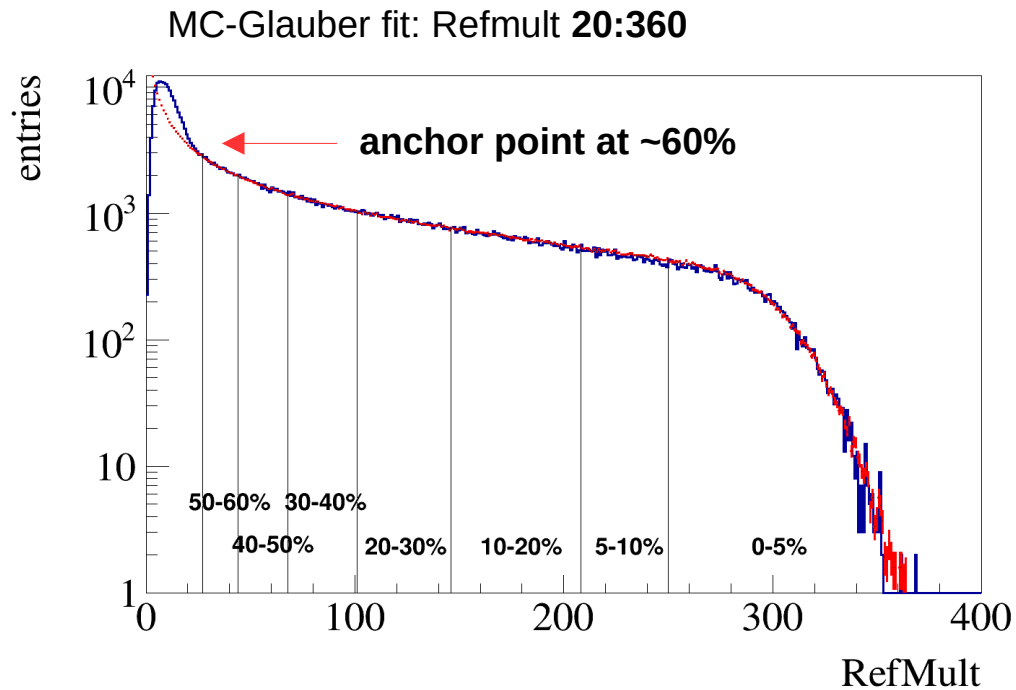
RefMult – number of charged tracks in TPC passed the following selection criteria:

- $p_T > 0.15 \text{ GeV}/c$
- $|\eta| < 0.5$
- $N_{\text{hits}} \geq 16$

Empty events are discarded!

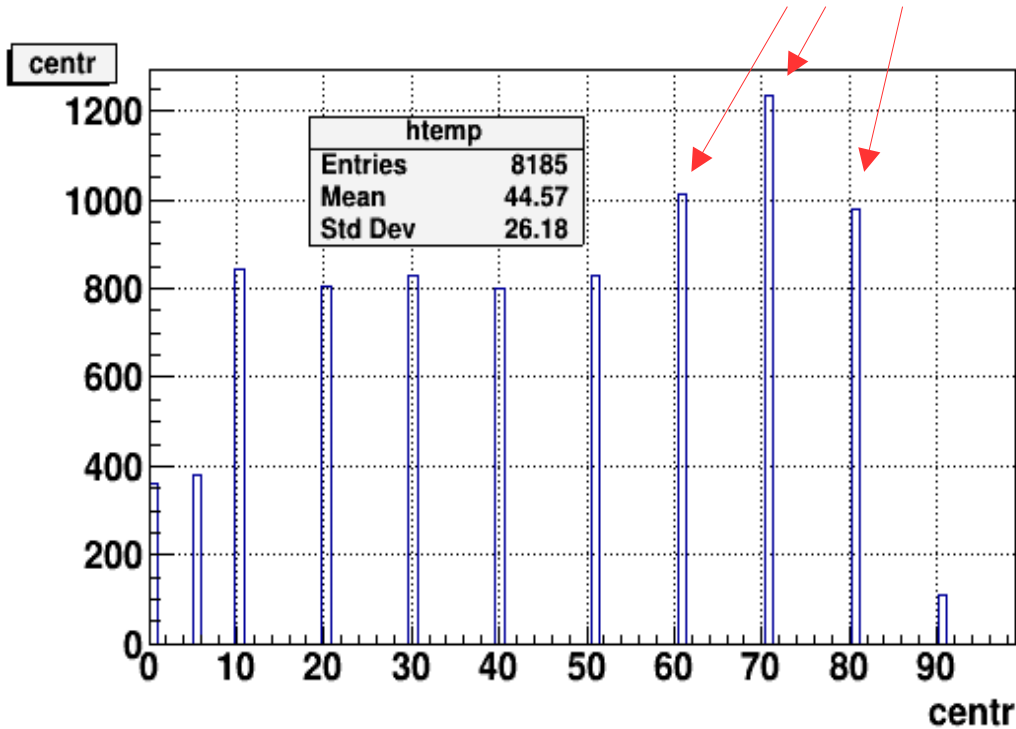
In order to skip empty event:

- Count N_p and N_n within MC track loop;
- if ($N_p == 166 \ \&\& \ (N_n + N_p) == 418$) continue;



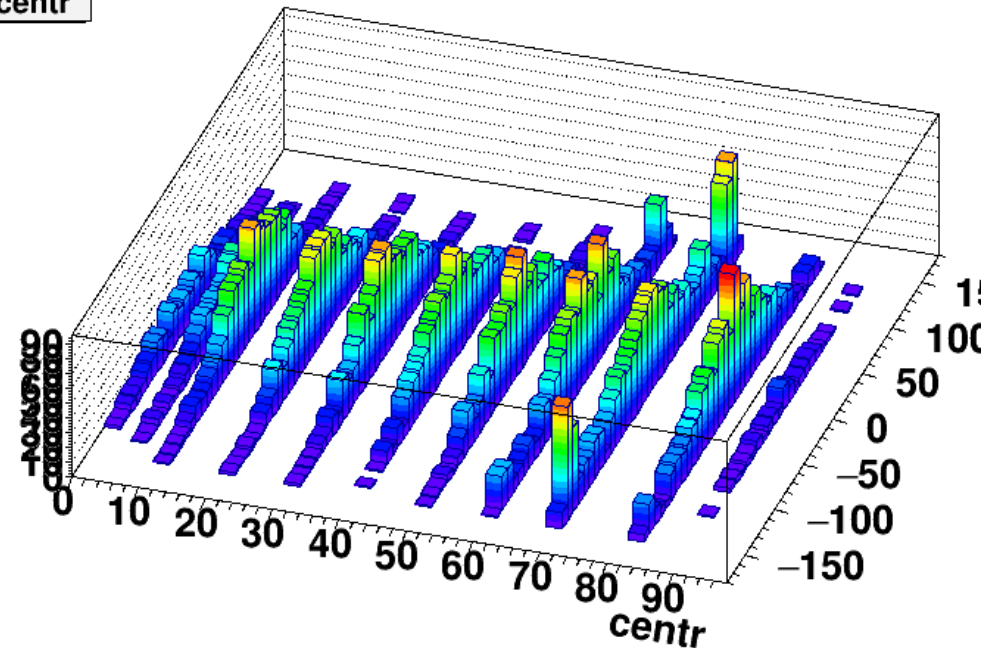
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Problem: there is an excess of events in peripheral bins (60-70%, 70-80%...)

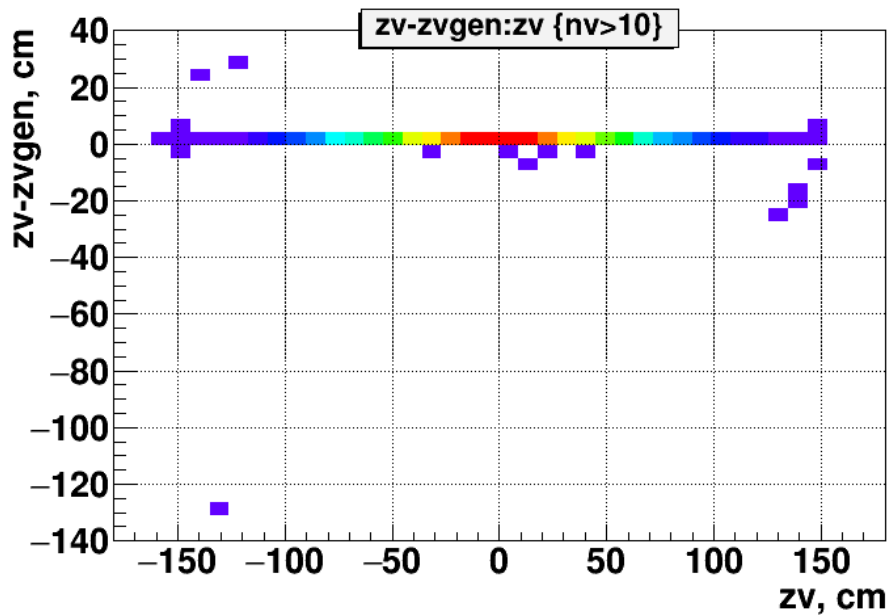
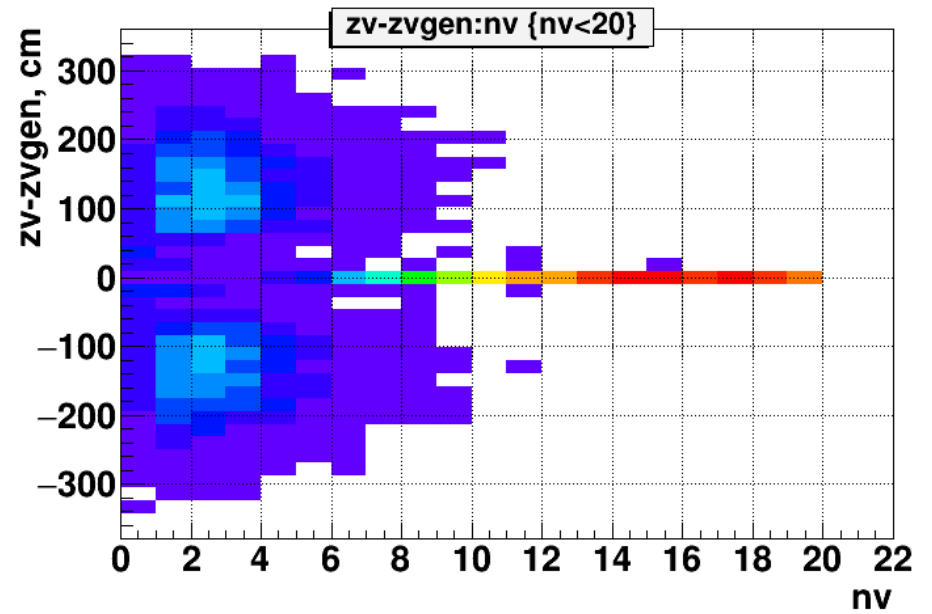
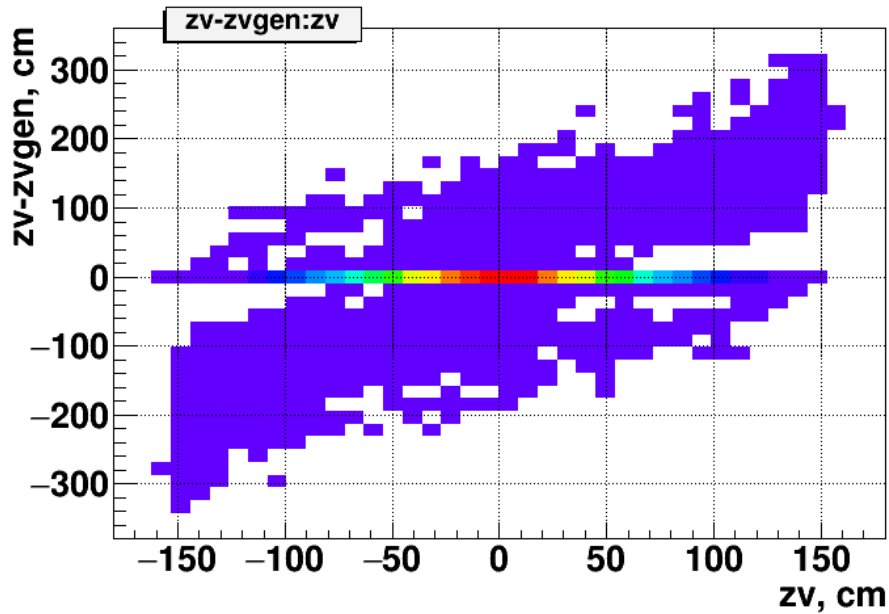


Possible reason: the appearance of the additional peaks at a distance of ~ 140 cm along the z-coordinate, especially for 70-80% centrality bin (the vertex is reconstructed in FFD?)

zv:centr

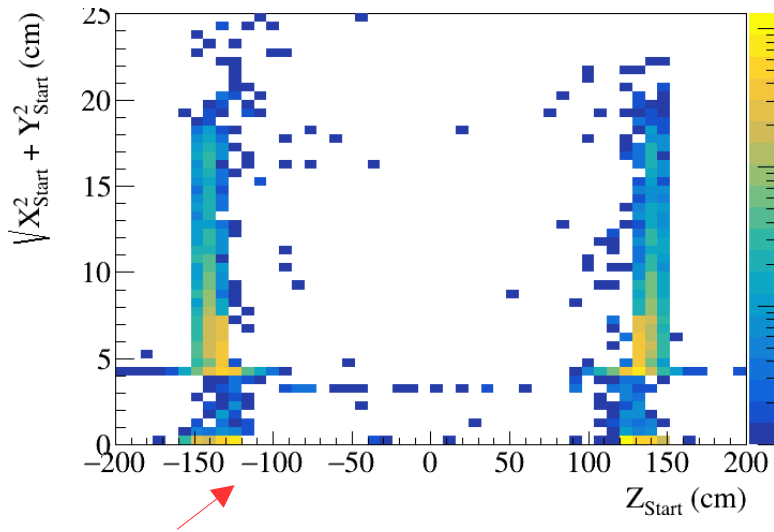
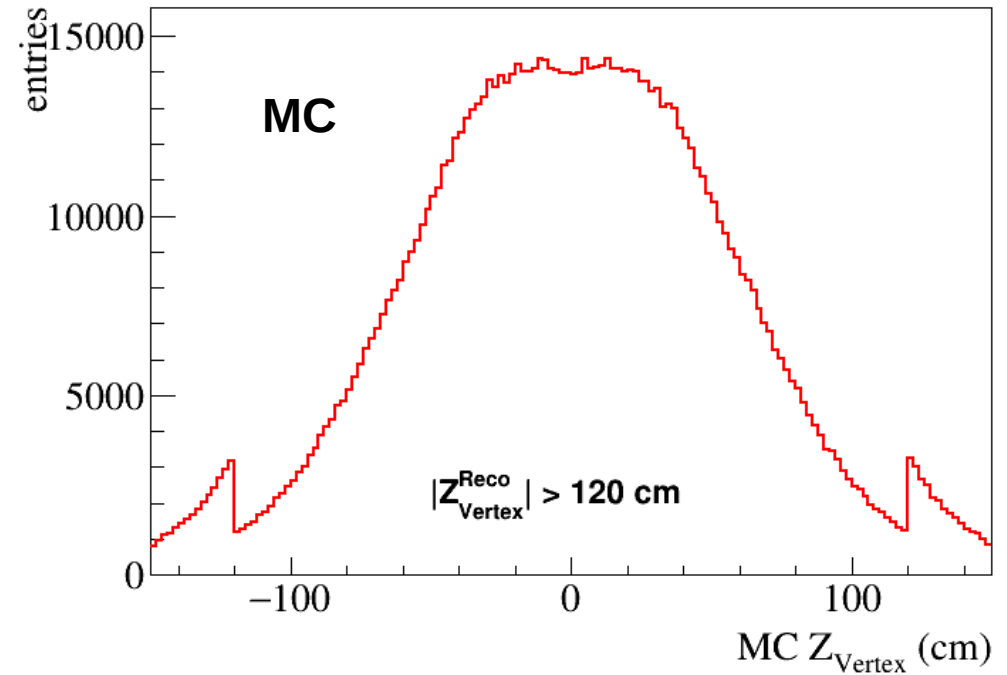
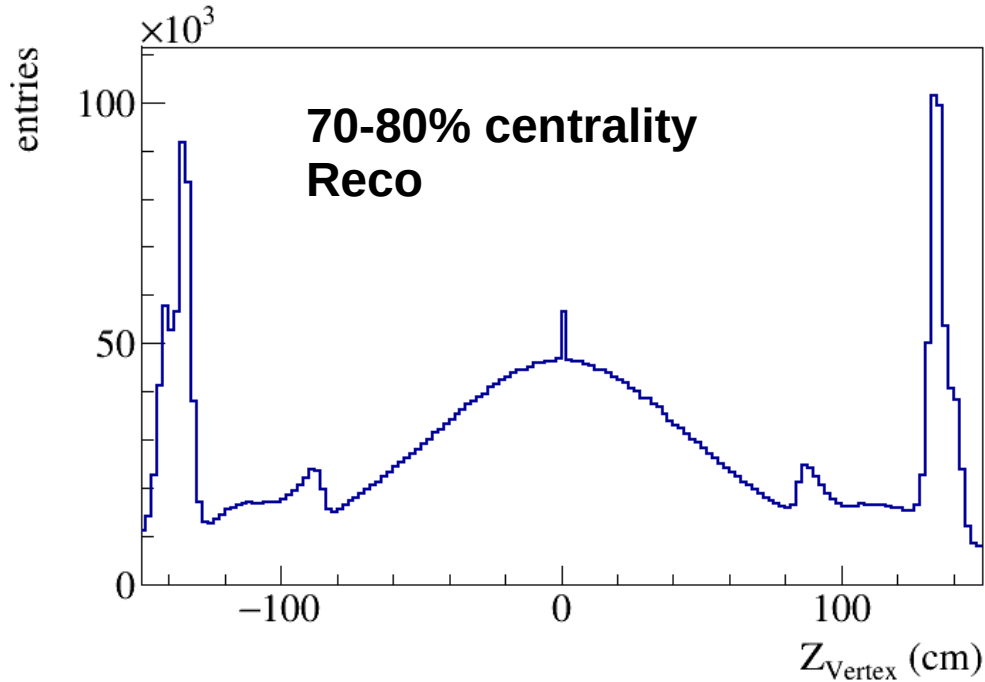


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nv – number of tracks which formed reconstructed vertex.

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Secondary particles which appear in FFD material form fake vertexes in peripheral events.

Possible solutions: discard events with $|Z| > Z_{\text{max}}$ or require that reconstructed vertex must be formed by at least N_{min} primary tracks.

Z_{MC} and R_{MC} origins of the reconstructed tracks which form vertexes at ~ 140 cm for centrality bin of 70-80%.

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What if we exclude events with fake vertexes via criterion to Z vertex position?

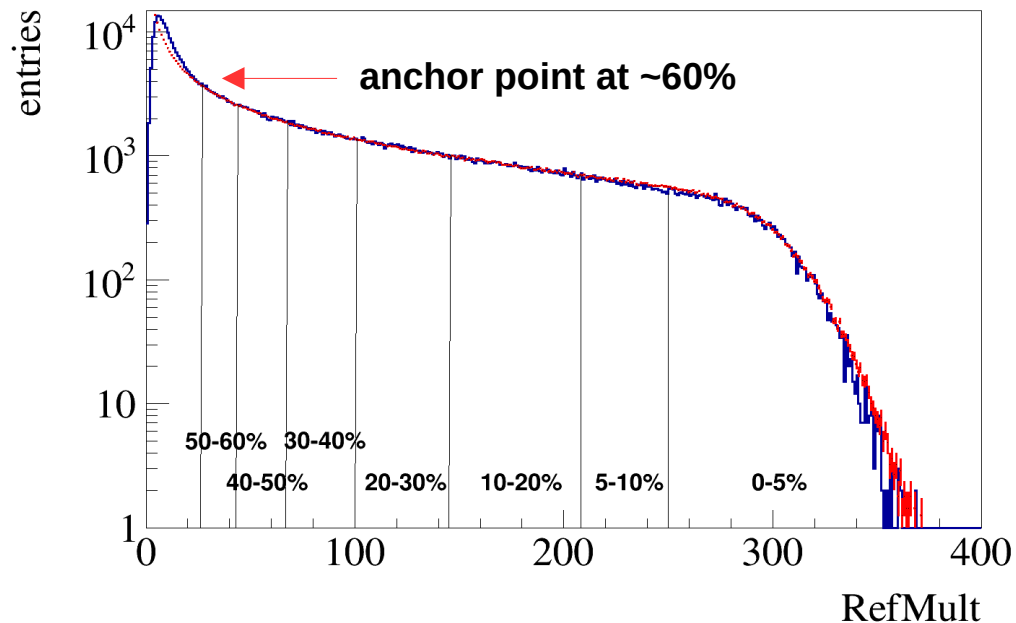
- $p_T > 0.15 \text{ GeV}/c$
- $|\eta| < 0.5$
- $N_{\text{hits}} \geq 16$
- $|Z_{\text{vertex}}| < 120 \text{ cm}$

Empty events are discarded!

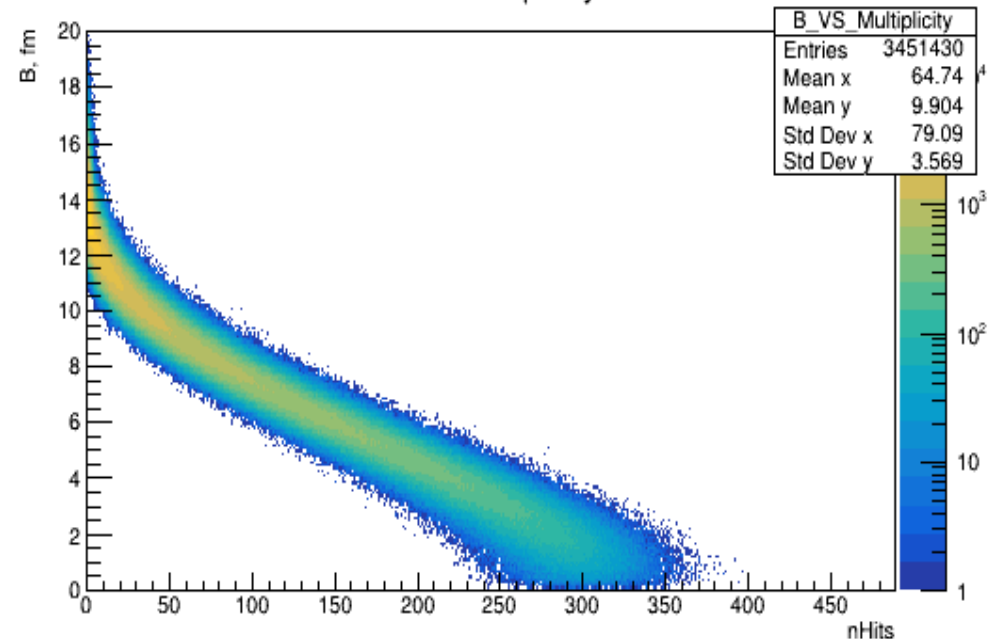
In order to skip empty event:

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MC-Glauber fit: Refmult 20:360

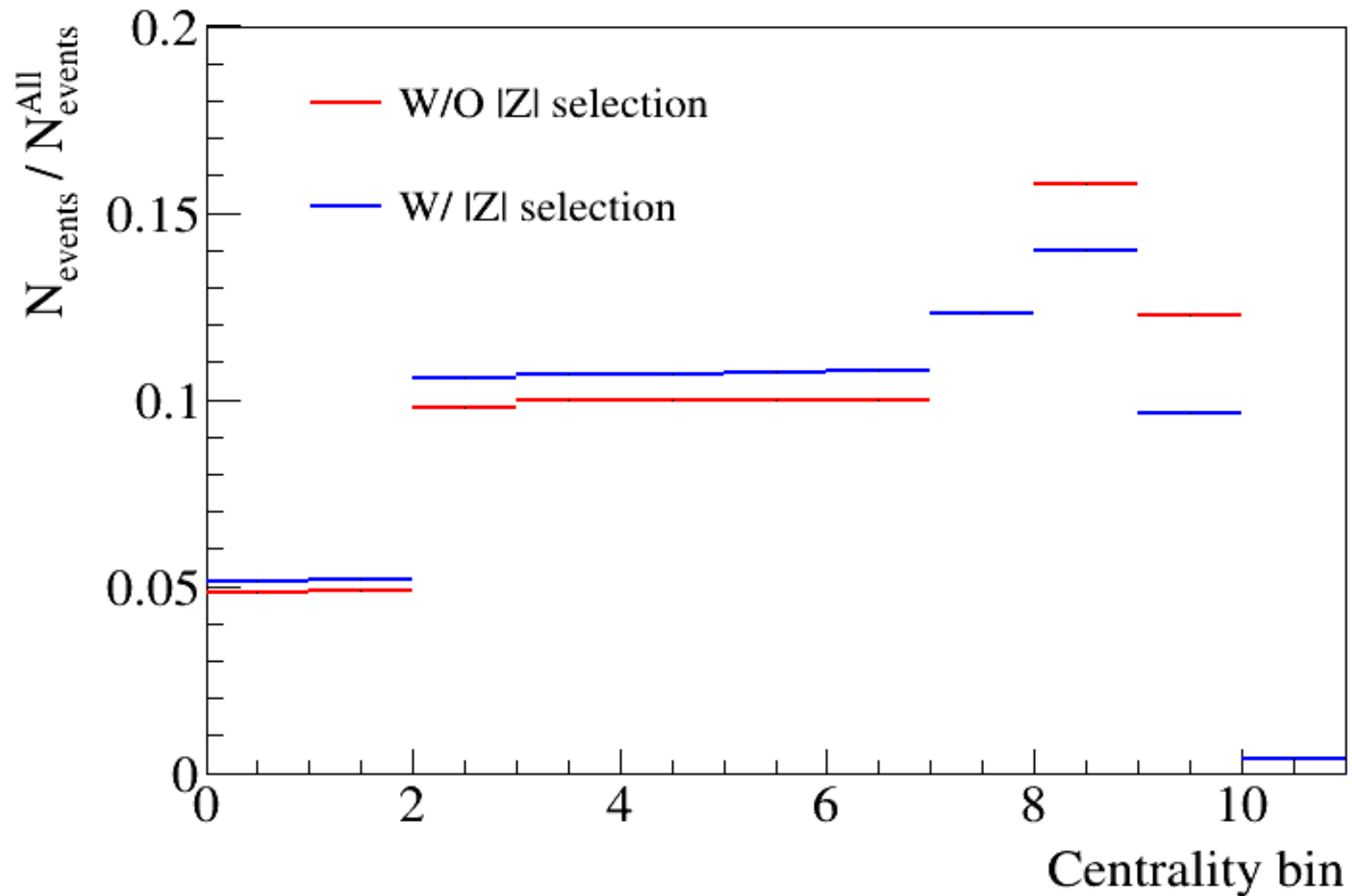


B VS Multiplicity



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Excess of events in peripheral bins is still seen



EXTRA SLIDES

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