

pp Accumulator

Accumulate pp events to study HBD pattern

recognition vs. Centrality

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Outline

- ❖ **Data and cuts.**
- ❖ **Code:**
 - **sanity check**
 - **modify to allow bbcz binning.**
- ❖ **Fraction of central arm electrons matched to HBD vs. $\langle n_{\text{Central}} \rangle$.**
- ❖ **Detector occupancy and HBD signal/background.**
- ❖ **Accumulate pp events with present WISClusterizer to study its performance with increasing centrality , and eventually it breaks.**

DATA

RUN 09 mb Data.

Non Working Module (ES1) is excluded.

eId Cuts

Track Quality = 31, 51 & 63

$n_0 \geq 3$

$E/p \geq 0.6$

$\text{abs}(\text{emc_dz} + 1.59) < 10.0$ or $\text{abs}(\text{emc_dphi} + 0.000156) < 0.030$

$\text{abs}(\text{hbd_dz}) < 4 \text{ cm}$ & $\text{abs}(\text{hbd_dphi}) < 0.04 \text{ rad}$

Sanity Check

In the original version the results were not the same for 1 Accumulated and w/o Accumulation. That has been fixed by changing the indexing of the cells.

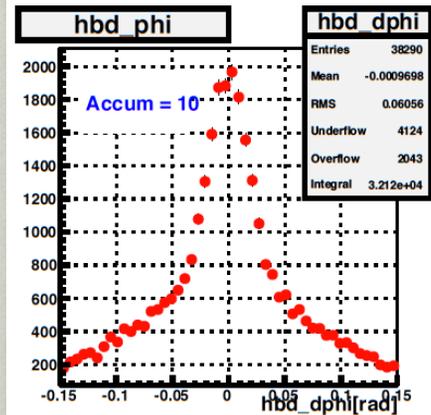
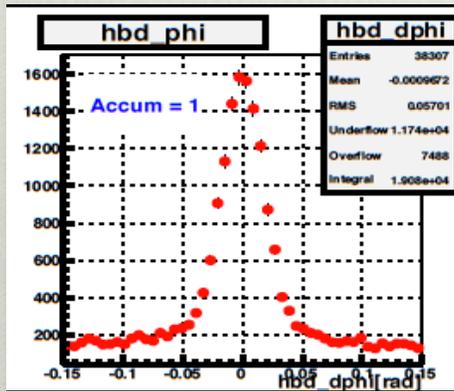
| TYPE | <Central Arm Tracks> | <Central Arm Electrons/event> | Total no of Central Arm Electrons | Electrons in abs (dz)=4 cm abs (dphi)=0.04 rad | After Random Subtraction (Swapping Method) |
|----------------------|----------------------|-------------------------------|-----------------------------------|---|--|
| W/O Accumulator | 2.154 | 0.006733 | 38309 | 10323 | 9564 |
| 1 Event Accumulation | 2.154 | 0.006733 | 38309 | 10323 | 9564 |

bbcZ binning

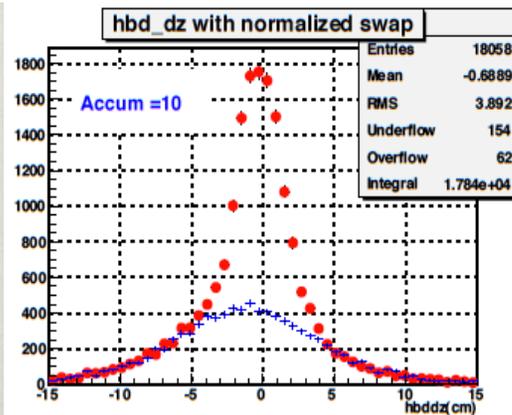
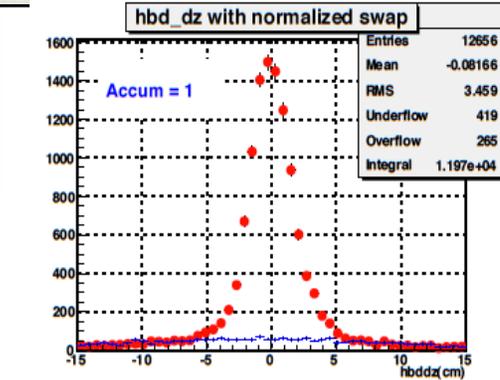
- > The code was modified to accumulate events with same vertex.
- > In the following study we use 1 cm bin of vertex to accumulate pp events.

Matching Distributions

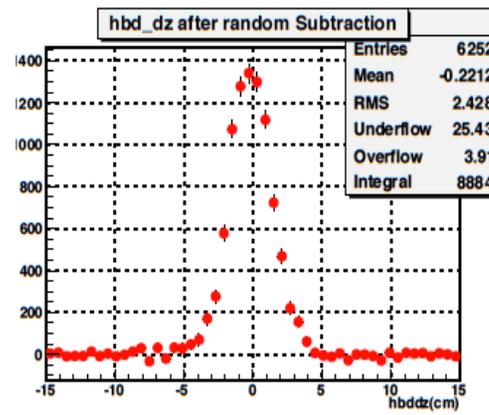
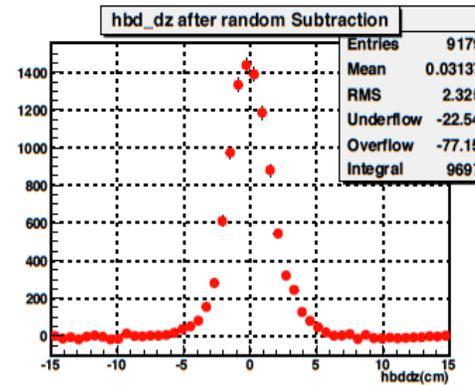
hbd_dphi(rad) matching

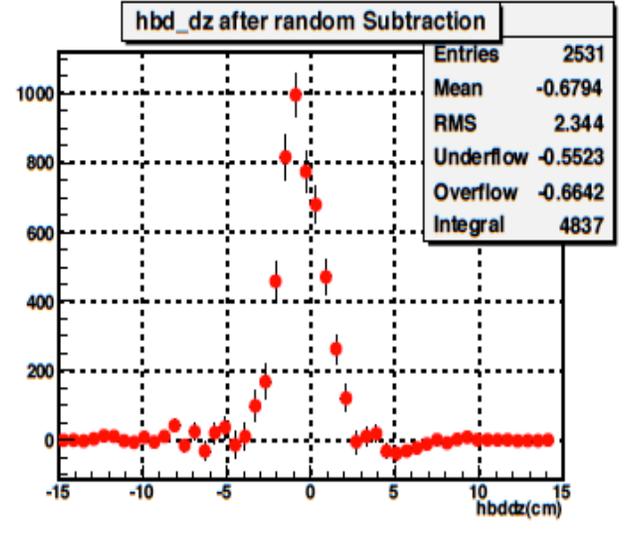
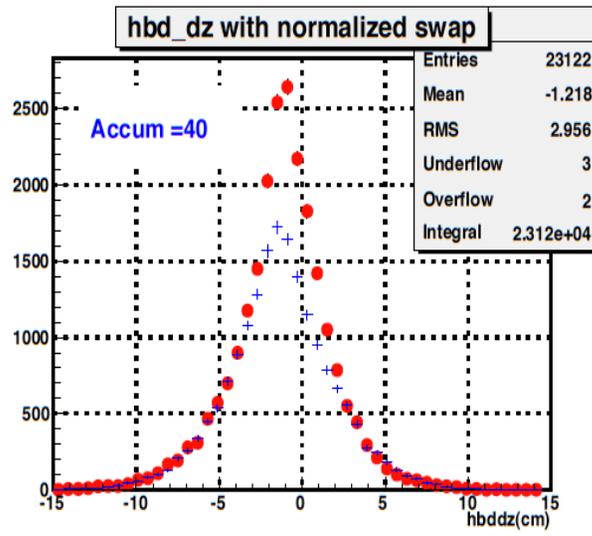
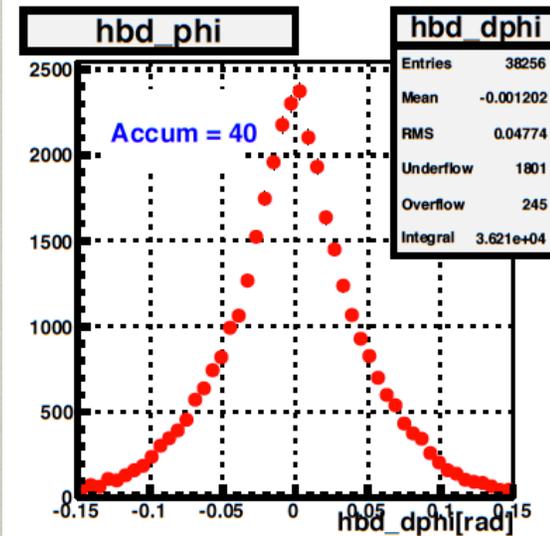
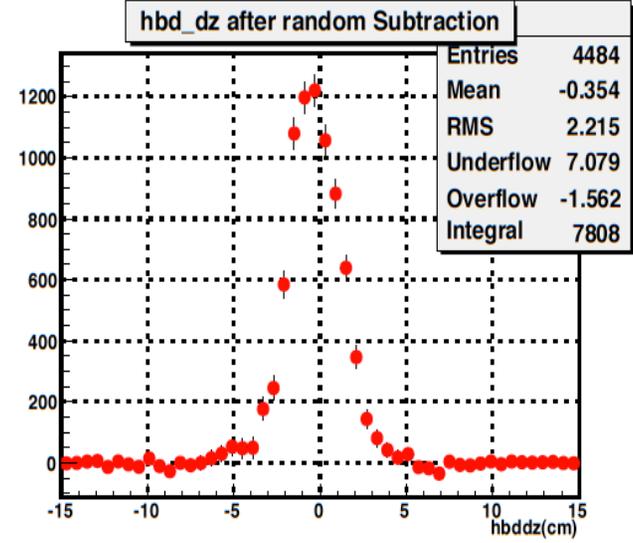
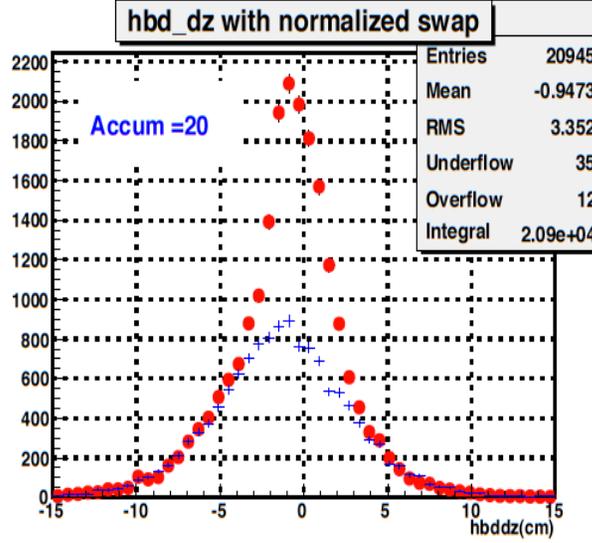
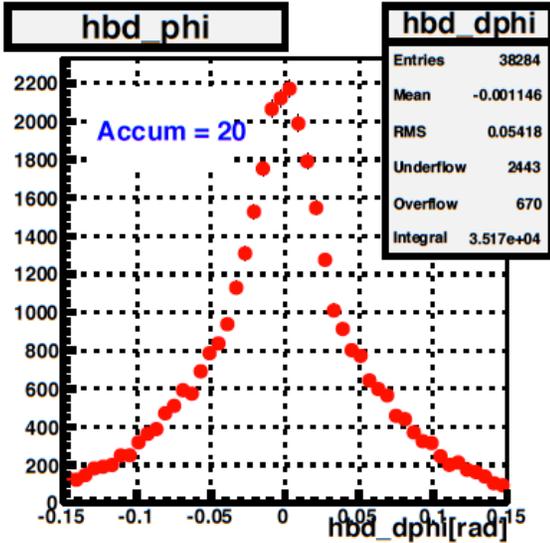


hbd_dz(cm) after dphi cut.
And
normalized swap distribution



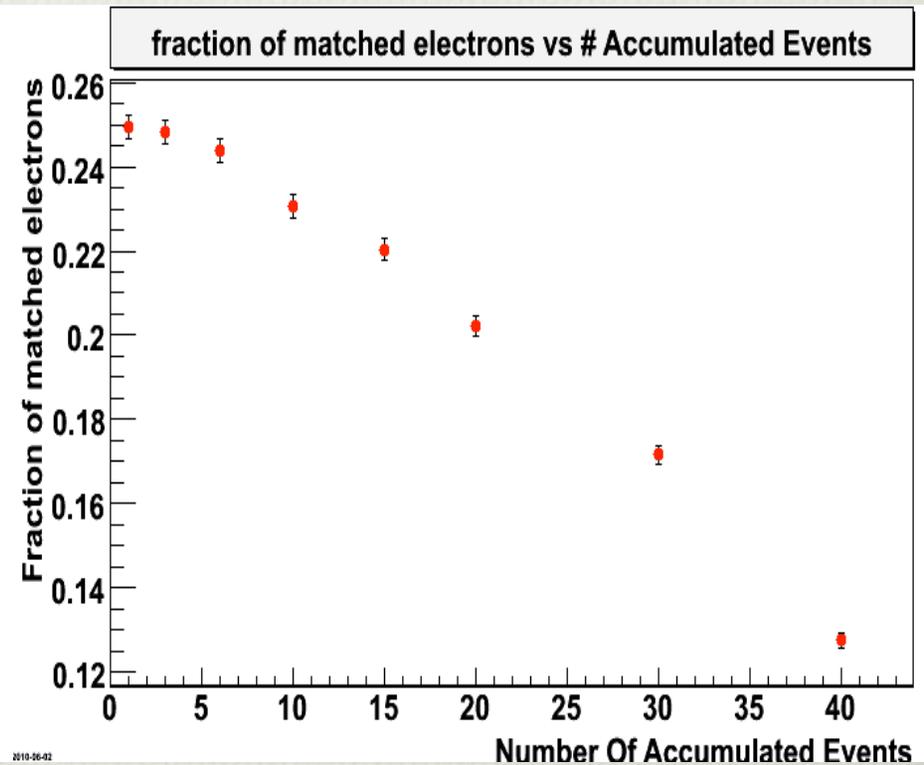
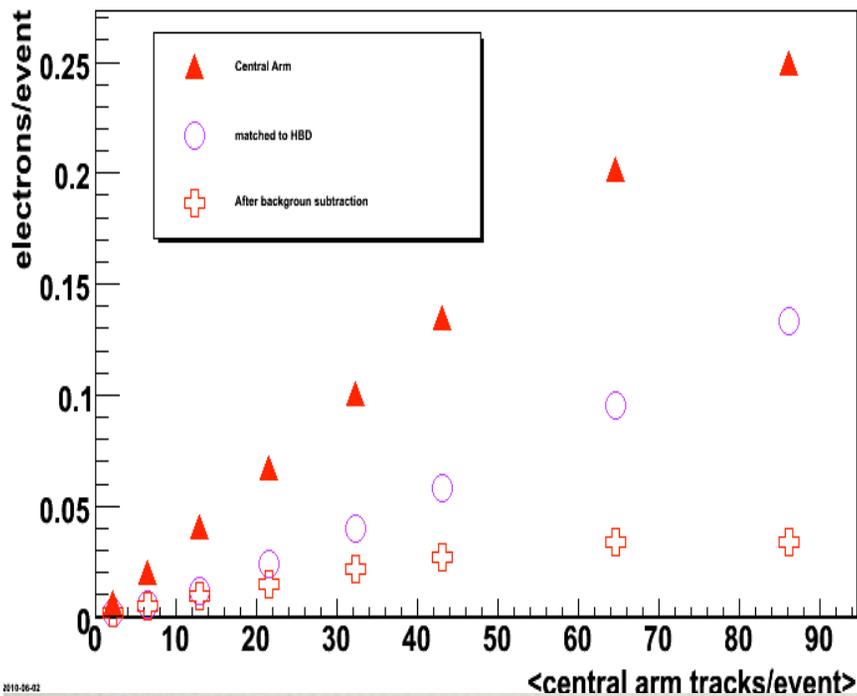
hbd_dz after background subtraction



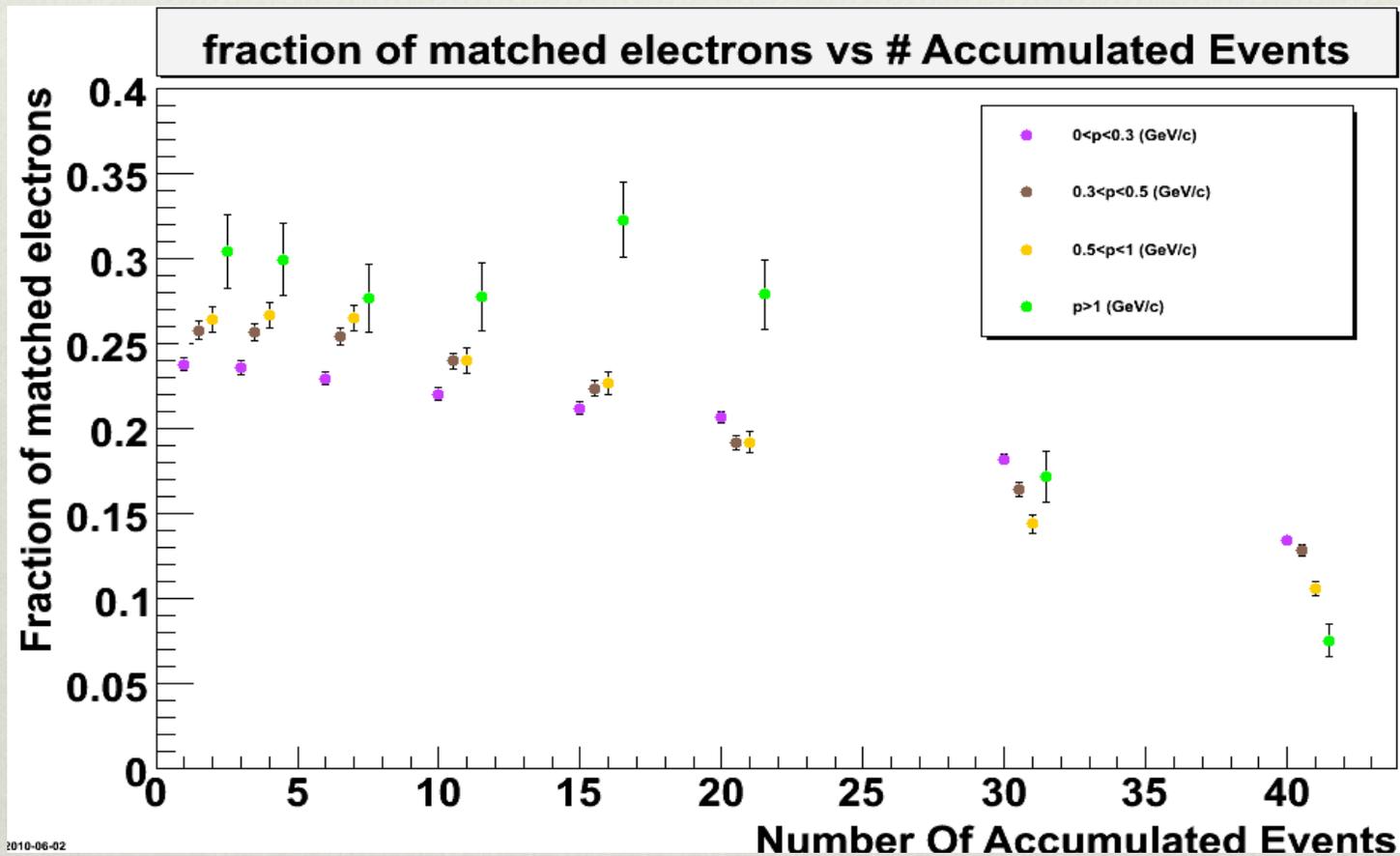


Electrons per Event vs. $\langle n_{\text{Central}} \rangle$

$$\text{Fraction} = \frac{\text{(matched electrons to HBD)}}{\text{(central arm electrons)}}$$

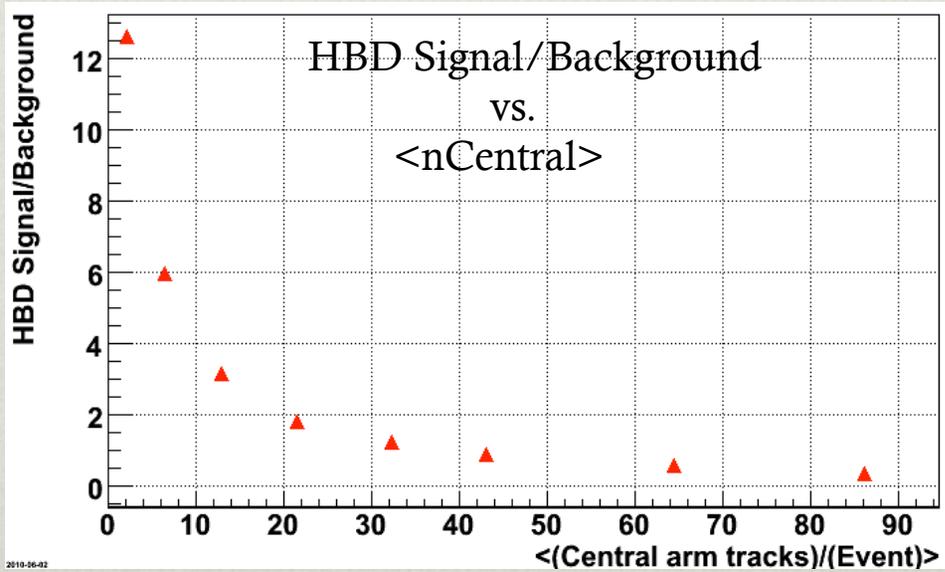
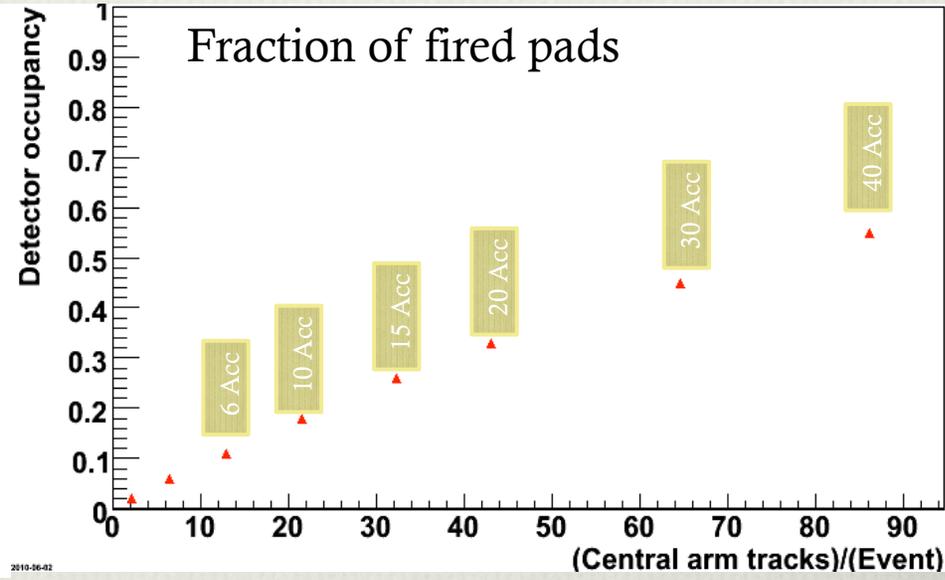
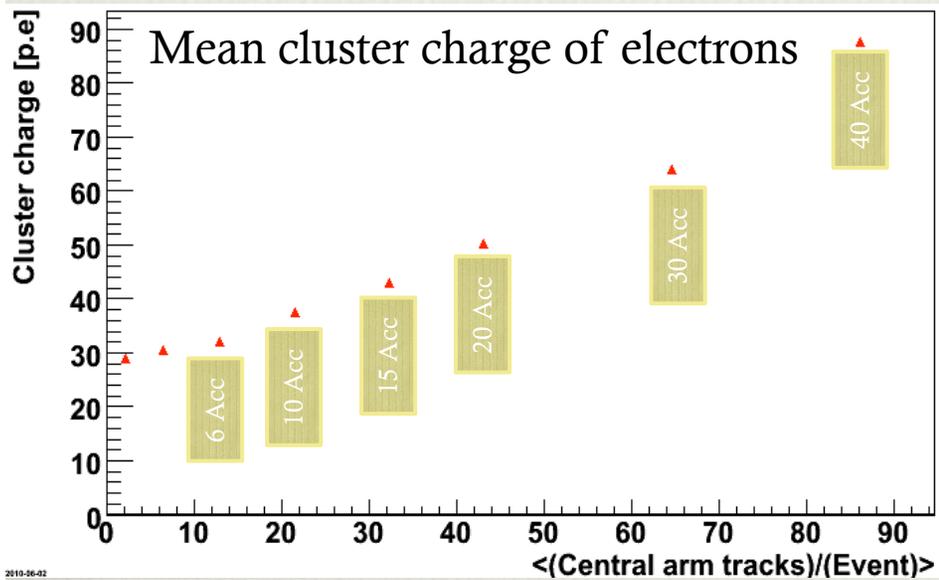


Momentum dependence of electron loose



2010-06-02

From Event Accumulator



2010-06-02

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Summary

- ❖ We loose more real tracks in low momentum region.
- ❖ After pedestal subtraction on the accumulated data has to be studied.

Thank You