

Update on $\gamma\gamma \rightarrow$ low pt hadrons study

ILD Analysis and Software meeting

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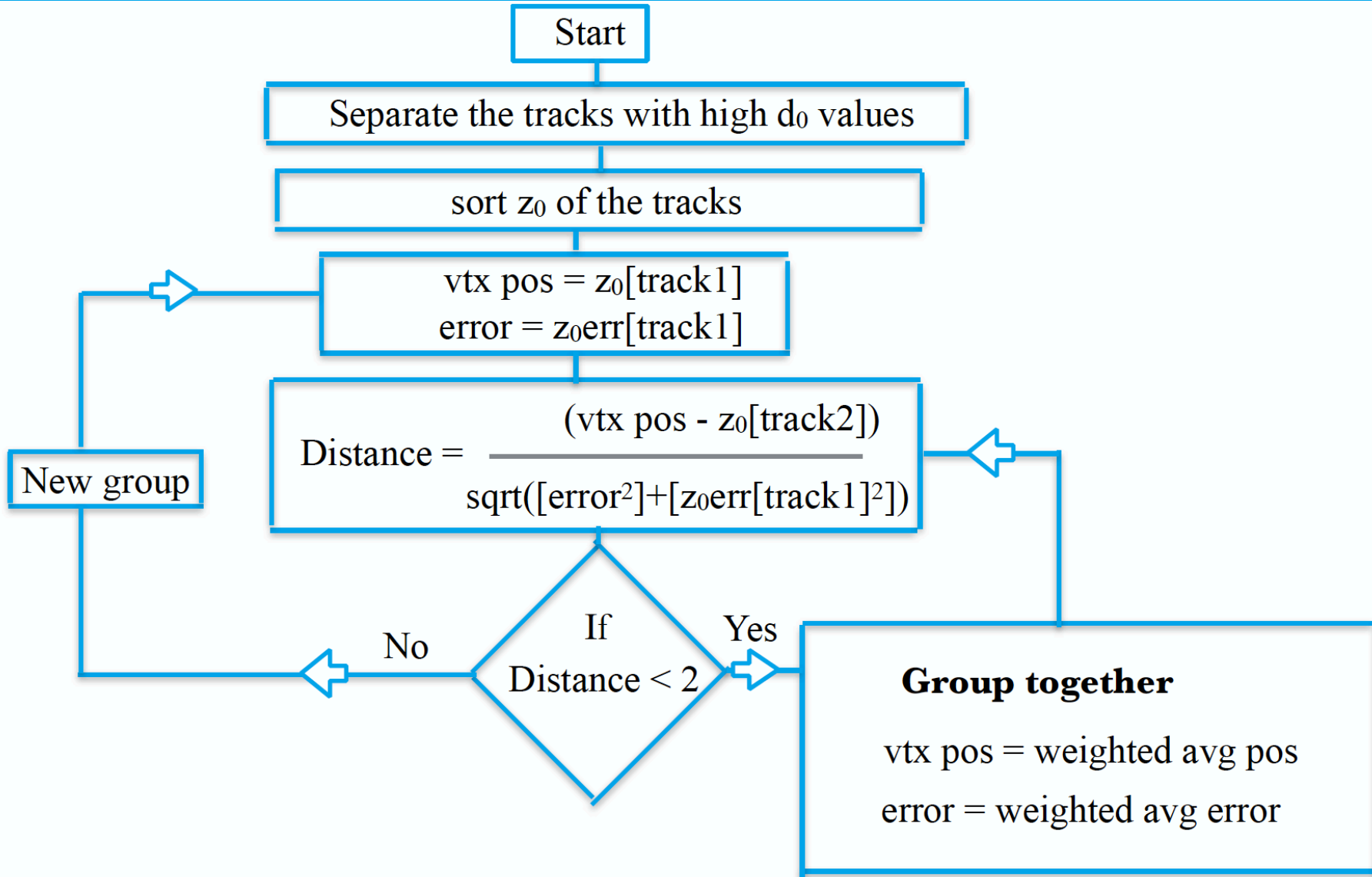
Possible method to remove $\gamma\gamma \rightarrow$ low pt hadrons

- Displacement of vertices in z direction
- Vertices of $\gamma\gamma$ overlay events displaced from that of signal vertices
- Identifying the tracks coming from such vertices and removing them would be an effective method
- Standard vertex finding algorithm reconstructs one single primary vertex for each event
- More complex algorithm to group the tracks to find different vertices

Cuts for the algorithm

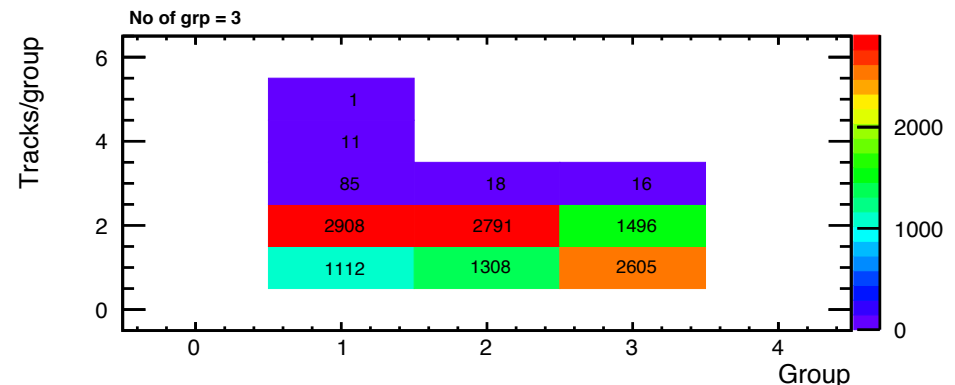
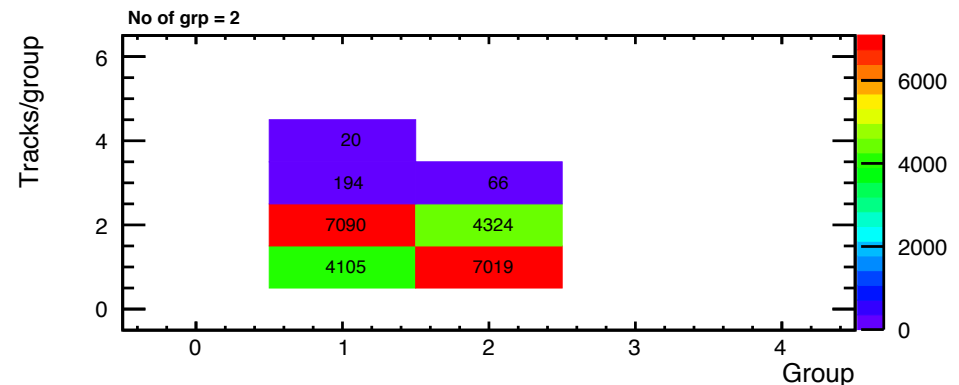
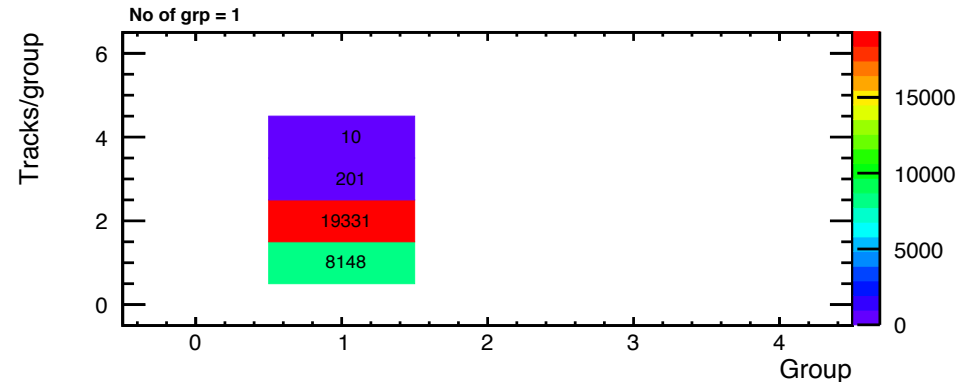
- > Presented in detail in Pre-ILD meeting KEK Feb 2018.
- > Cuts for algorithm:
 - Number of tracks < 12
 - Z_0 of the track < 15 mm
 - Veto the tracks associated with V_0
 - Track with highest d_0 considered as a signal track

Algorithm



No of tracks in a group

- Plots show no. of groups - no. of tracks per group
- The last group always has no. of events less than others
- Algorithm - compares distance from left to right with adjacent tracks
- The average position is shifted towards left
- Algorithm - position dependent



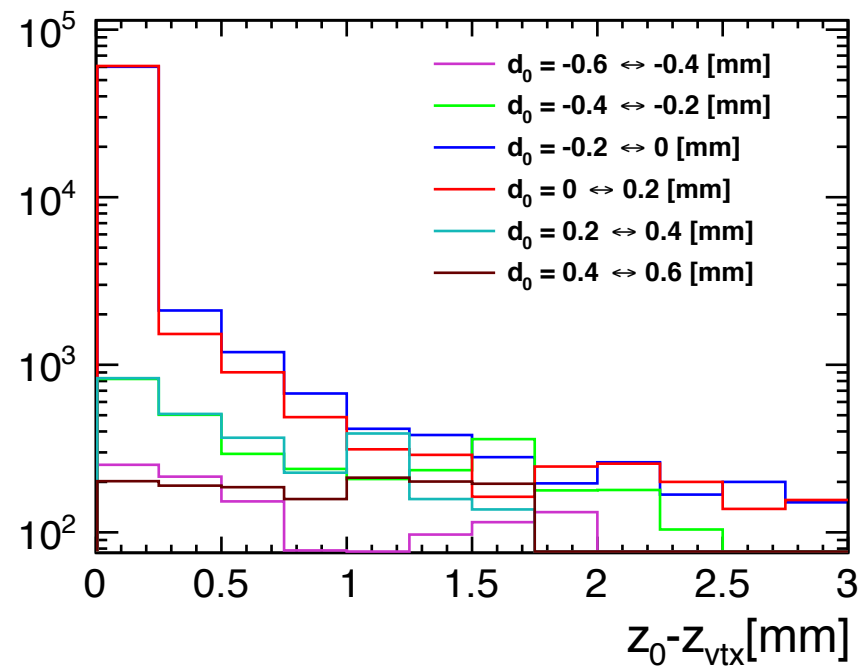
Cuts for new algorithm

> The older cuts:

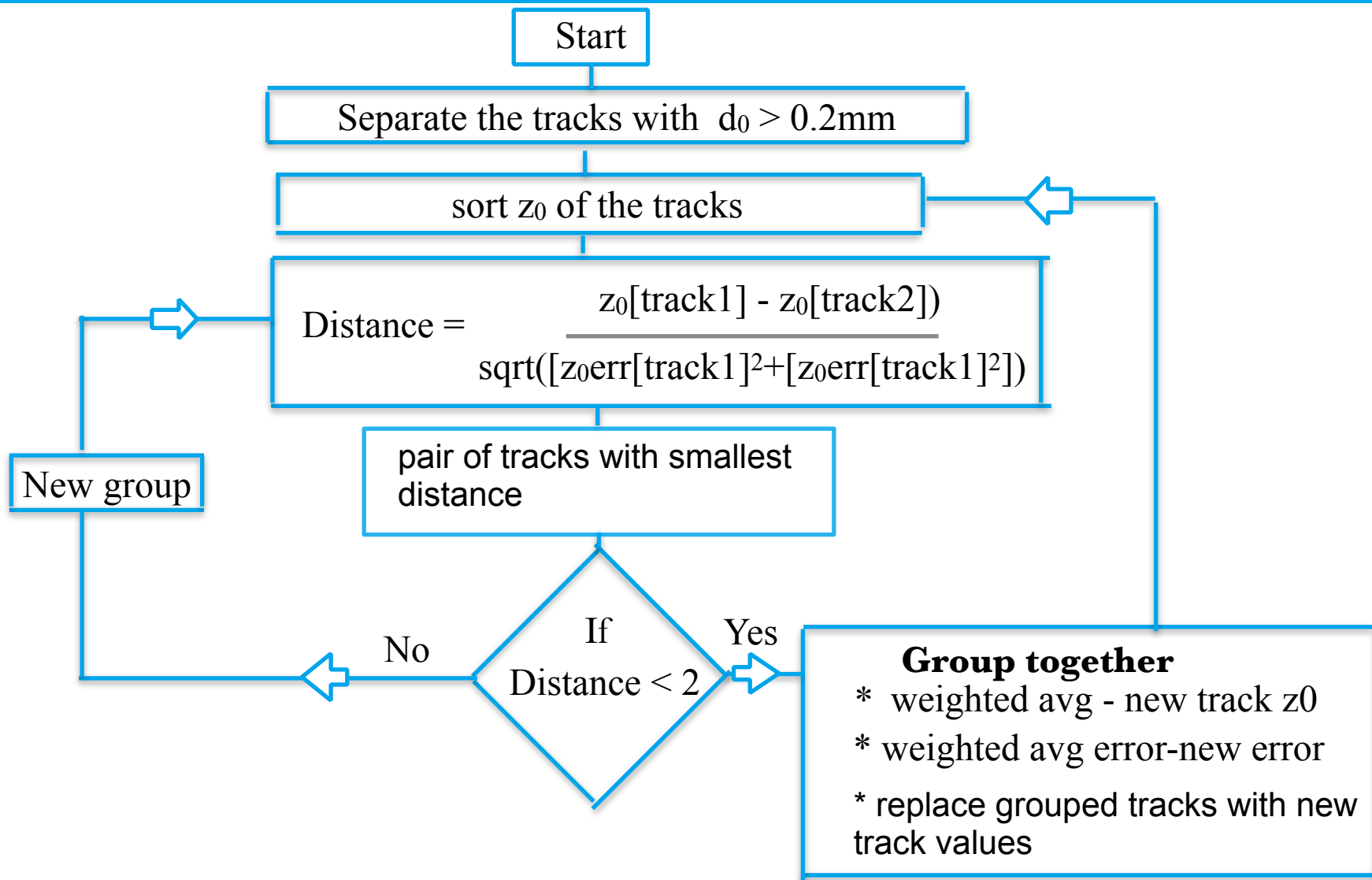
- Number of tracks < 12
- Z_0 of the track < 15 mm
- Veto the tracks associated with V_0

> A new cut :

- Tracks with $d_0 > 0.2$ mm are not considered for now
- Need to be treated differently



New Algorithm



Conclusion

- > Grouping algorithm used earlier - position dependent
- > Average position of the track shifted to the direction from where the grouping started
- > New algorithm with an additional d_0 cut introduced and formed
- > Work in progress

