



HIGGS SELF-COUPPLING ANALYSIS WITH $H \rightarrow WW^*$

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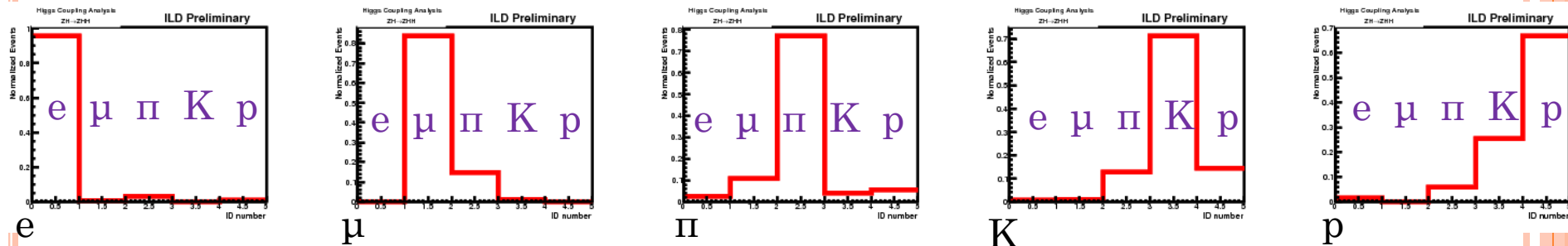
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STATUS

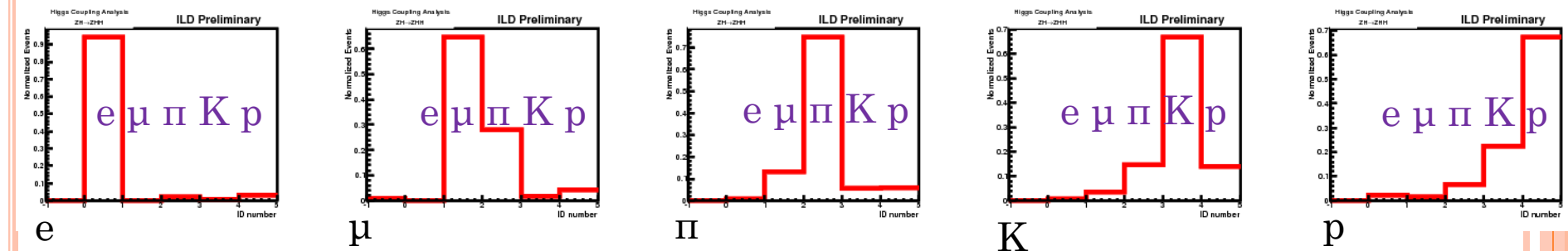
- Change the method of reco/MC matching
 - So far, matching low p tracks with MC was not good
→ matching eff. is low
 - Change the method to match all the tracks with MC truth
 - Re-check the ID efficiency for each particle type
→ μ/π separation is going worse due to low momentum μ
 μ stops in the calorimeter
- Optimizing particle ID method for track energy correction
 - Thanks to new matching, truth visible energy can be obtained
- Re-start to check secondary (thirdary...) vertex
 - Bug fixed

RESULT OF ID EFFICIENCY WITH NEW MATCHING

Old matching result



New matching result

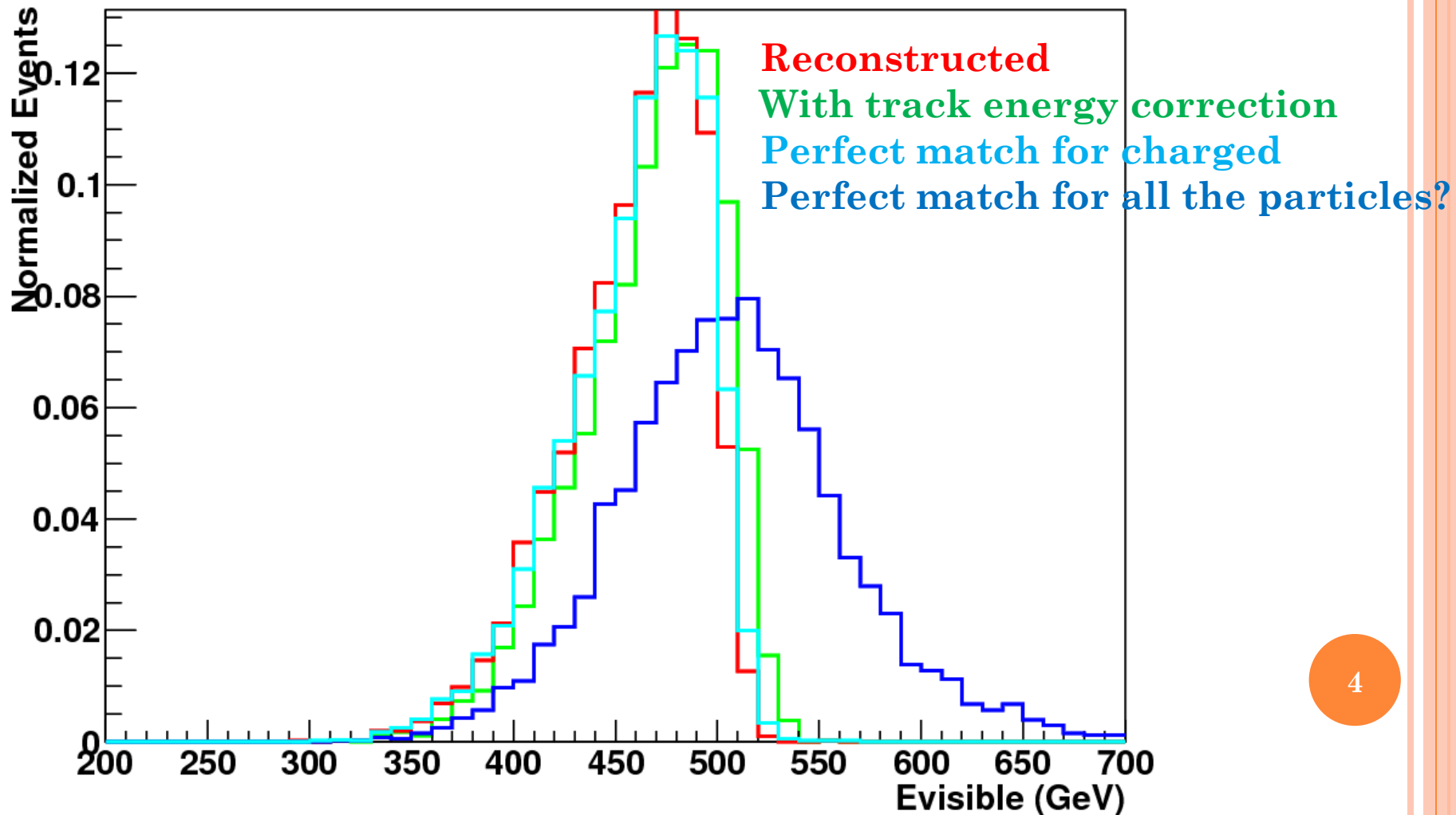


μ ID eff. is going worse due to low momentum muon

- Stops in the cal. \rightarrow μ/π separation is worse
- Hadron ID effs. don't go so bad!

VISIBLE ENERGY DIFFERENCE

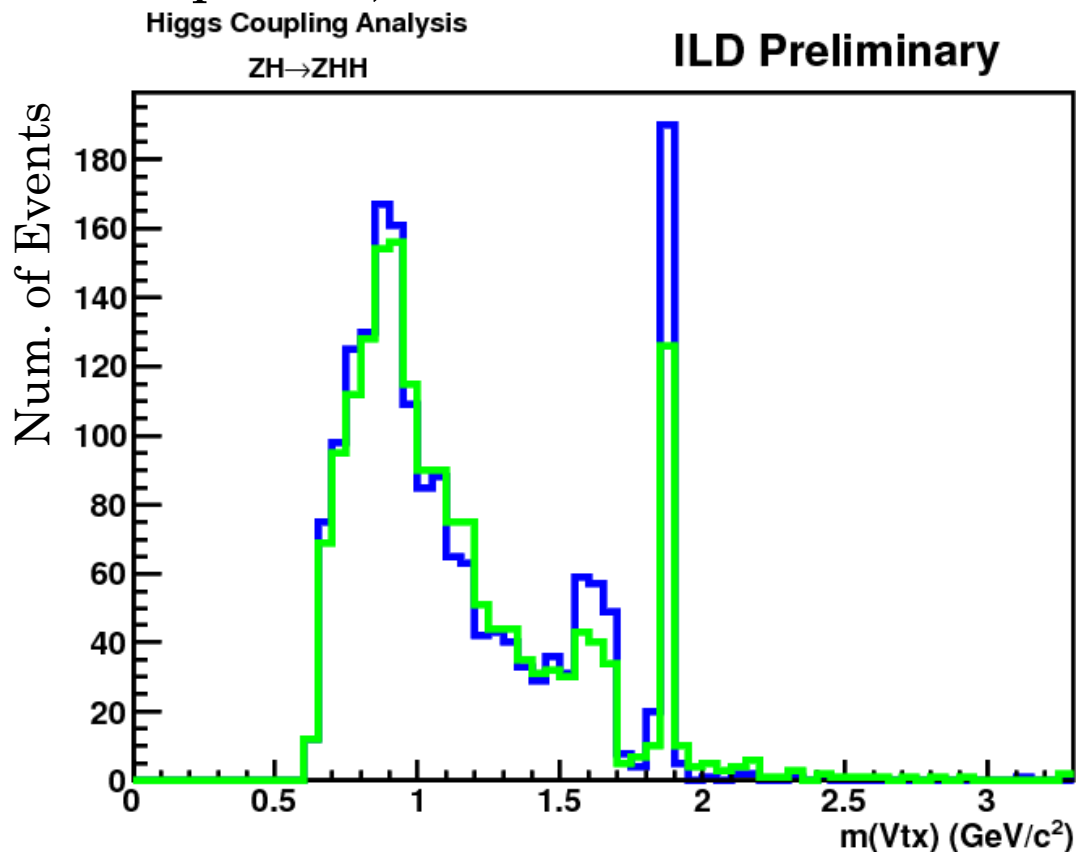
- Evis distribution for $qqHH \rightarrow qq(bb)(bb)$
 - Looks over estimation – between green and skyblue is important



MASS DISTRIBUTION ON VERTEX

○ Vertex with 2 prong $K^+\pi$ candidates

- This is just the example!
- Bug on particle ID is fixed
- Vertex is from LCFIPlus
- D meson peak can be seen clearly
- If particle ID is perfect, 2 distributions will be same



TODO

- Particle ID optimization
 - Set rejected tracks for better E visible?

- Start to the detailed study about vertex
 - Check the B meson decay mode
 - Check the D meson decay mode
 - Catch some hints to b-tagging improvement