Check ctag distribution anomaly

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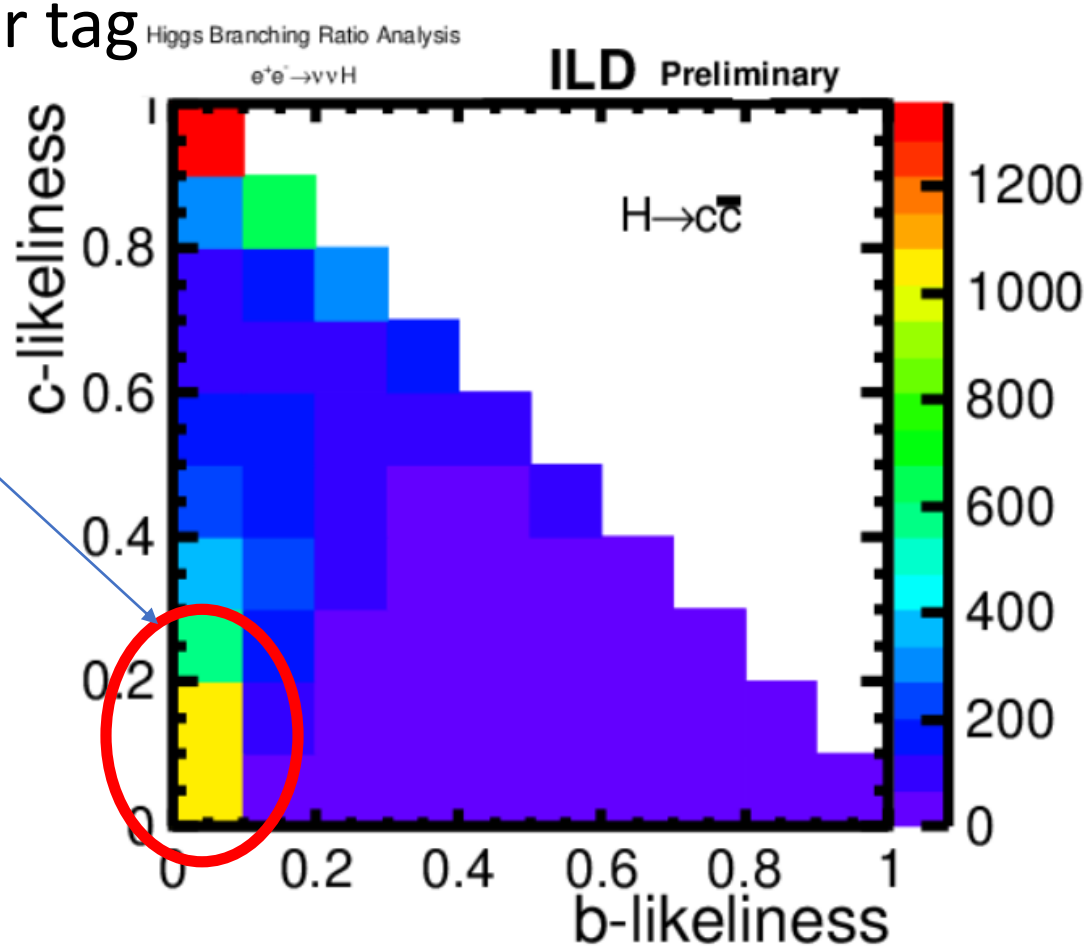
Check cause of this point

- Analysis of Higgs branching ratio measurement precision
- Estimation of precision of σBR(H→bb), σBR(H→cc), σBR(H→gg)
- Using template of flavor tag



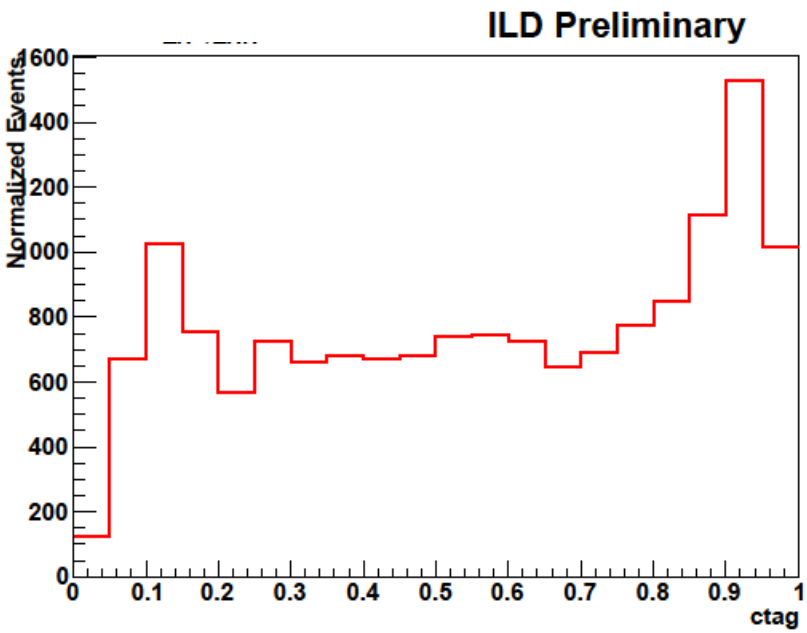
- Peak at this point
- No such peak@DBD
- Check it

LCFIPlus output

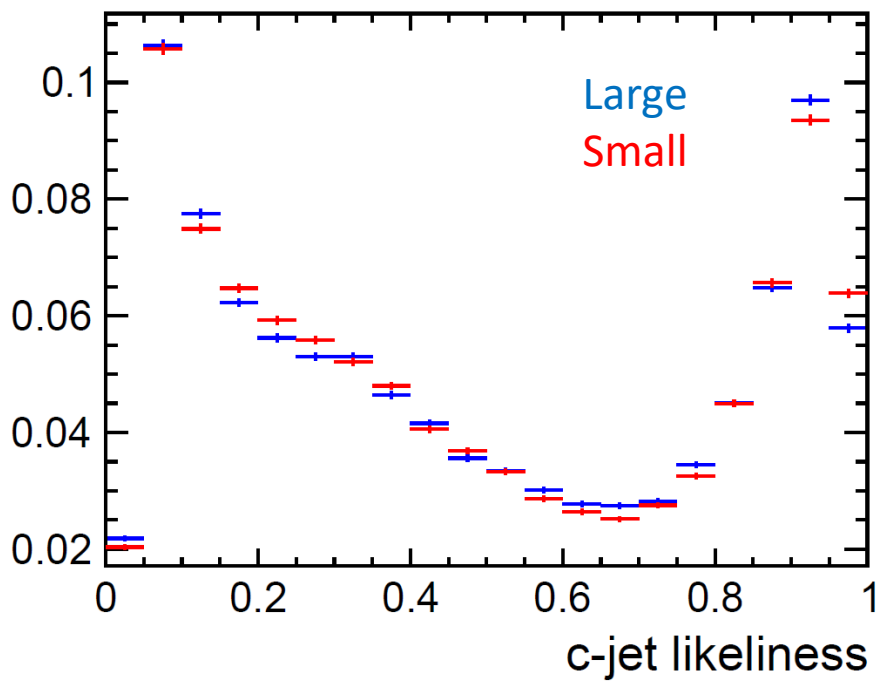
- nnh→nncc

Different, IDR has large peak at low ctag value(0.05-0.2)

DBD(everything DBD)



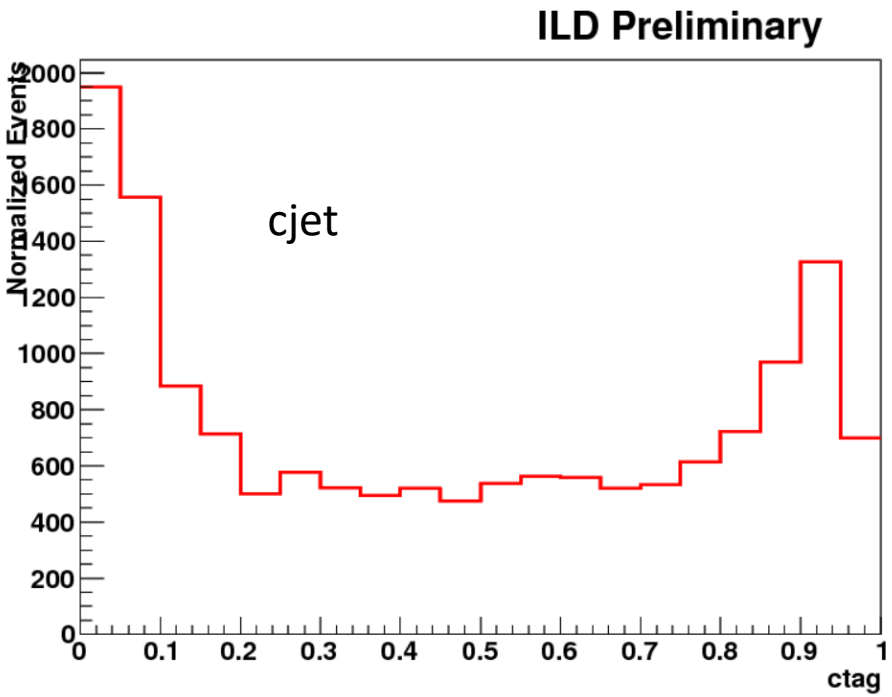
IDR



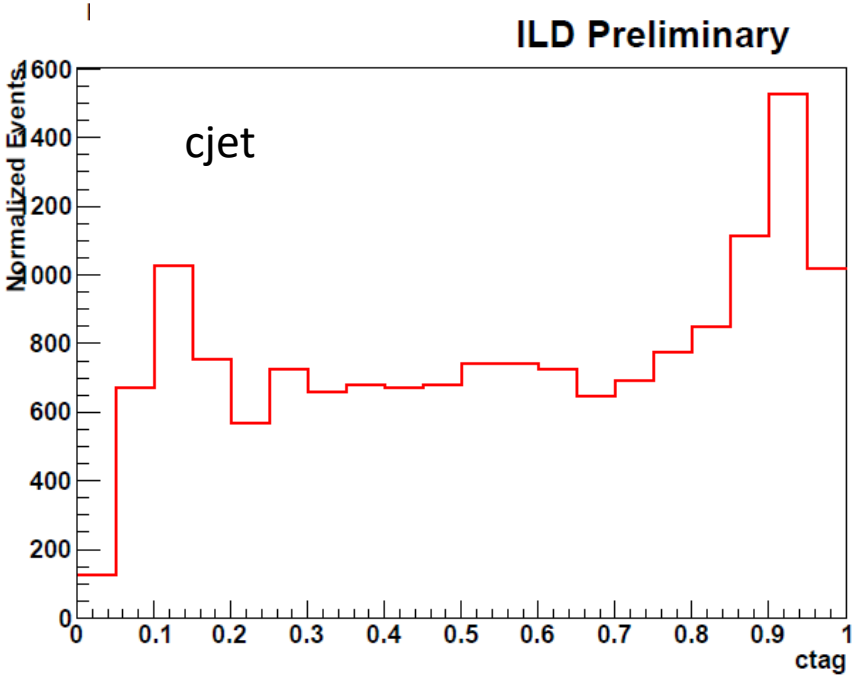
Use DBD sample with IDR environment

- Latest LCFIPlus calculates d0, z0 significance using primary vertex error
- When exclude primary vertex error, return to DBD distribution(DBD: no use of primary error)

DBD sample with latest ilcsoft(vertexing: DBD)



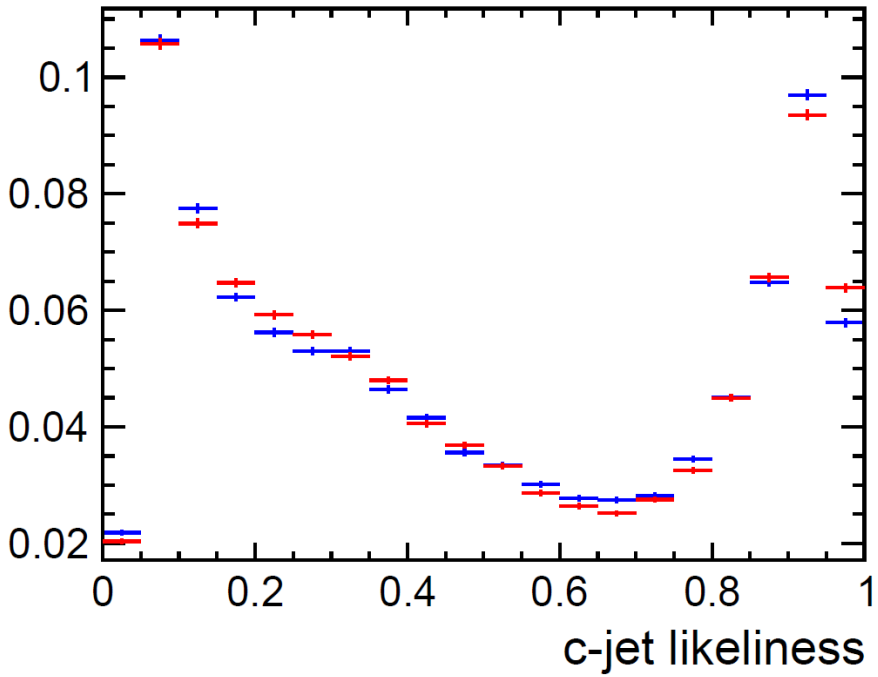
DBD sample with latest ilcsoft(primary error off)



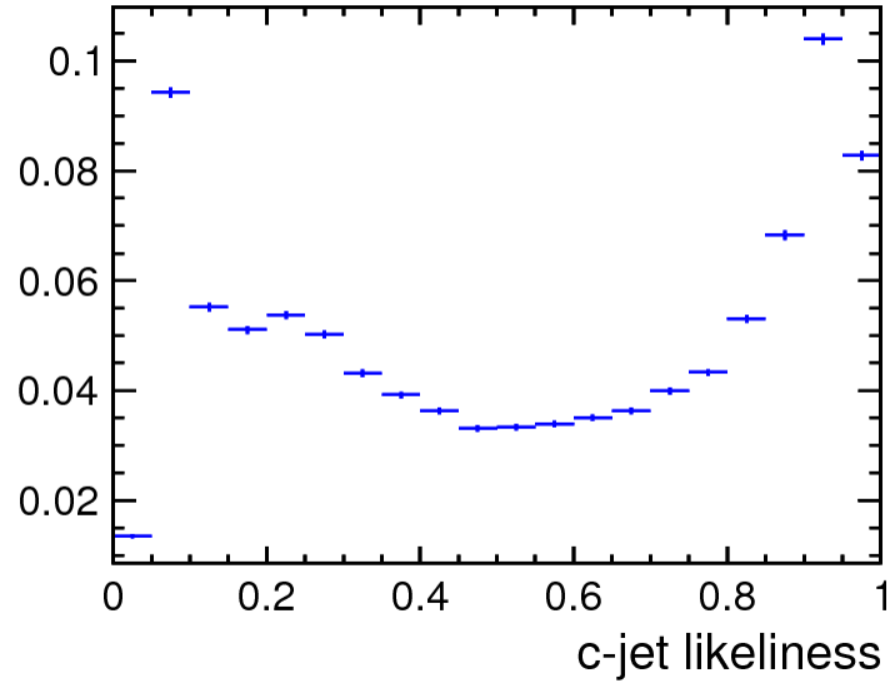
IDR sample

- But, even if exclude primary error, there still has a peak…
- So, LCFIPlus output is already different between DBD and IDR

IDR sample with latest LCFIPlus



IDR sample with latest LCFIPlus(primary error off)

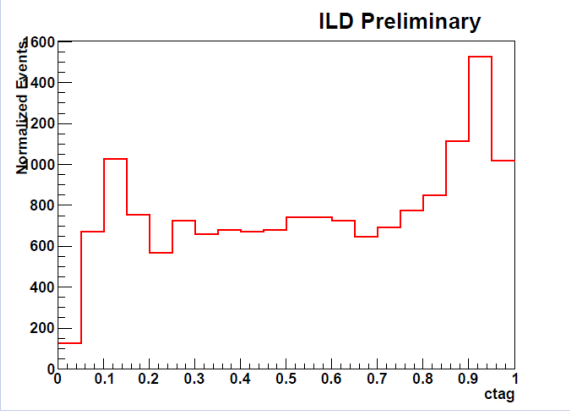
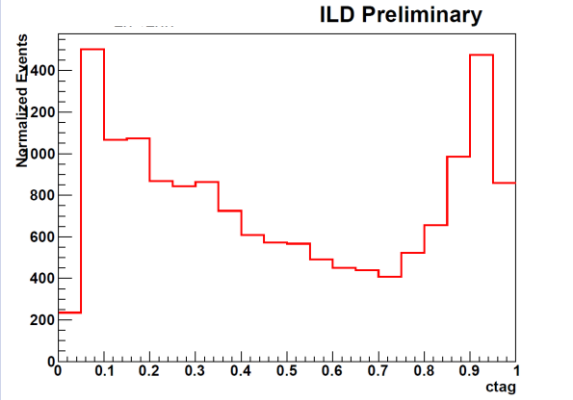
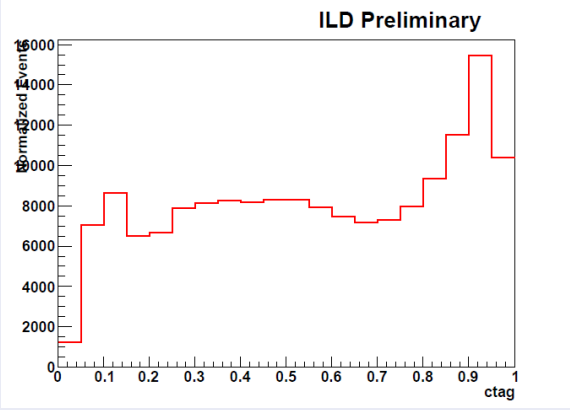
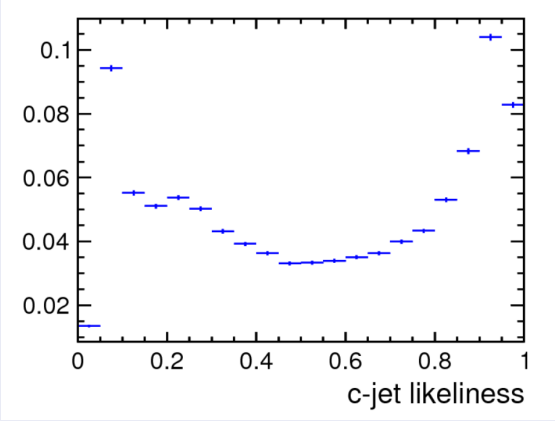


Check all the status

- For comparison, primary vertex error off to calculate d0, z0 significance
- For IDR sample, re-vertexing use (corrected) latest LCFIPlus
- Change sample /analysis environment for all the combination

  DBD / DBD DBD / IDR

  IDR / DBD IDR / IDR

sample / environment	DBD	IDR
DBD sample		
IDR sample		

- Same shape between DBD/IDR sample with DBD environment
- Same shape between DBD/IDR sample with IDR environment
- Different shape between DBD/IDR environment

2 possibilities

1. Reco. after DST(Jet clustering, Refining vertex, etc.) is different between DBD and IDR
   - But, peak mainly comes from 0 vtx c jet

   →Impact parameter is a main player, which is determined at DST reco.(tracking) already

2. TMVA version
   - DBD: 4.1.0 IDR: 4.2.1
   - TMVA often changes its configuration, so something is different between them?
   - e.g.)

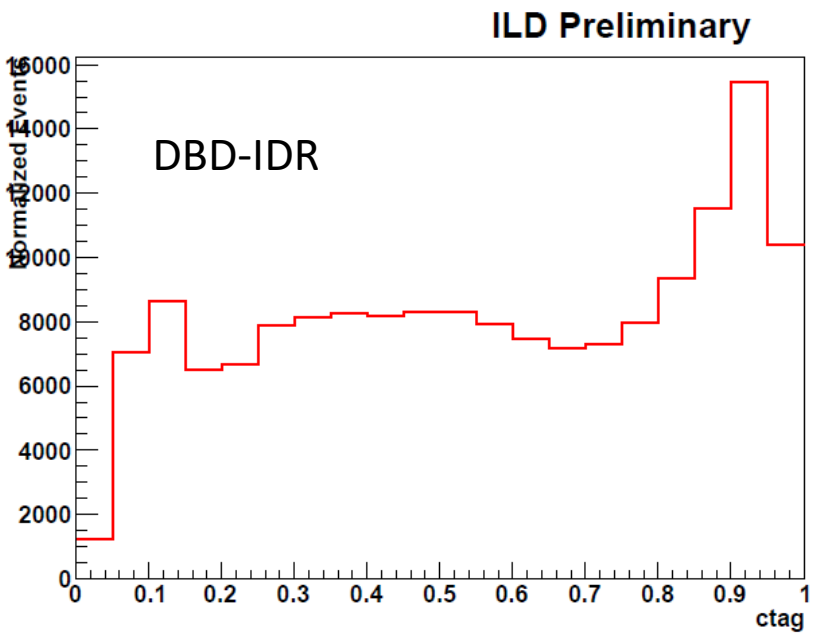
     Long time ago, CLIC found huge degradation of FT efficiency @ROOT6

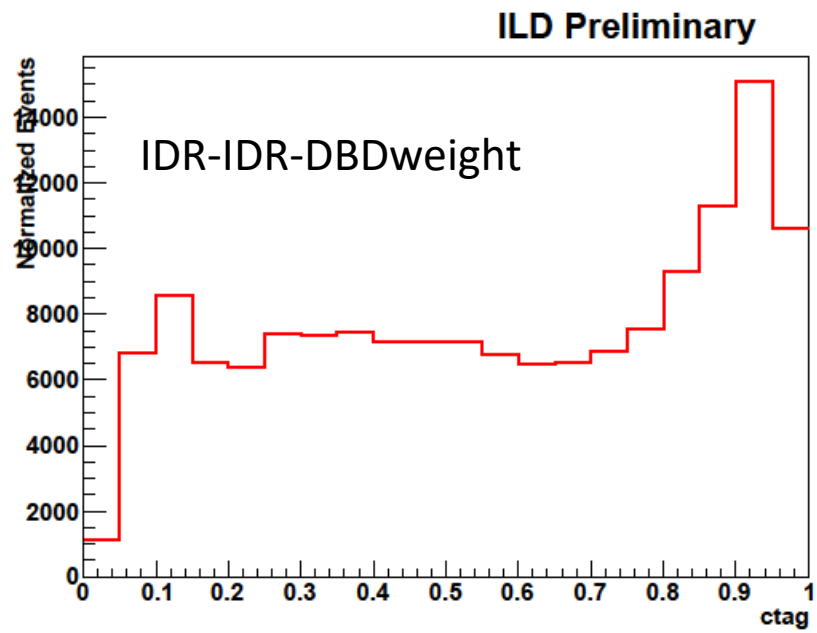
     This was coming from change of TMVA configuration

     →Taikan solved that point already

Trial

- IDR environment, IDR sample, but use DBD TMVA weight file





- Same distribution & same as DBD

→looks TMVA configuration

So,

- Sample difference(DBD/IDR) is not a problem
- Strange primary vertex error estimation boosts peak @low ctag value, but this is partial contribution
- Different version of TMVA might bring different output
- Efficiency is not sensitive to shape itself because it is relative difference among b/c/uds jet
  - We have checked it
- But, cannot reproduce DBD situation(same kinds weight file) using IDR flavortag sample…

  →under investigation

  hyper parameters of BDT???