

STATUS

Masakazu Kurata

03/03/2017

STATUS

- Higgs self coupling: continue to work for backgrounds
- Jet clustering: continue to investigate
 - Track assignment efficiency will be improved using **training** sample @300 events level
 - Typically, $\sim 80\%$ while $\sim 70\%$ for Durham jet clustering
- This improvement does not lead to drastic improvement of mass resolution!
 - Very high precision of track assignment efficiency is necessary...
- Over-fitting problem does not yet resolved...
 - More events will suppress over-fitting problem
→ I don't know how many
 - And need to introduce some idea
- Reducing num. of minijets does not work well
 - ~ 20 minijets does not work well...
 - So far, >50 minijets is OK.
 - Bugs? under investigation

VERY PRELIMINARY RESULTS

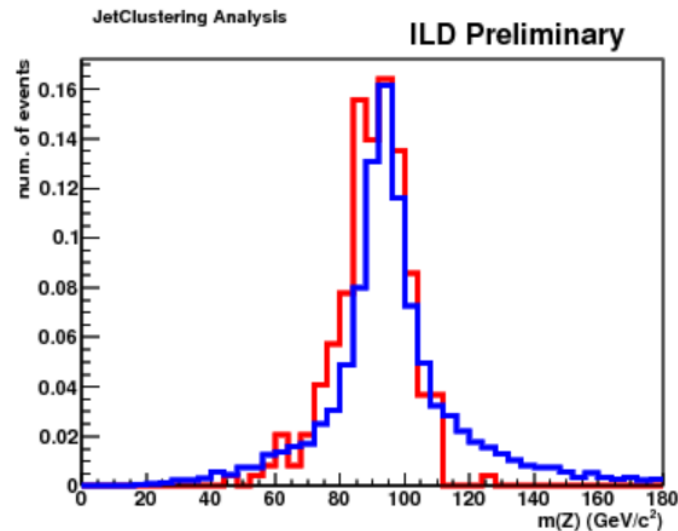
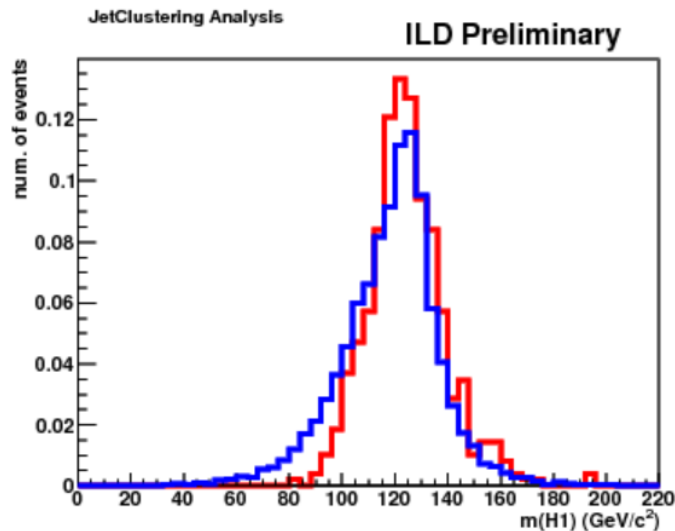
- Using 300 $ZHH \rightarrow (qq)(bb)(bb)$ events: 6 jet assignment
- Train network with 300 events
- Check assignment efficiency using **same** events

- Energy fraction of main color singlet state
 - Mean over 300 events
 - Energy ordering of the jets as a result of perfect Durham jet clustering (this is used as an answer)

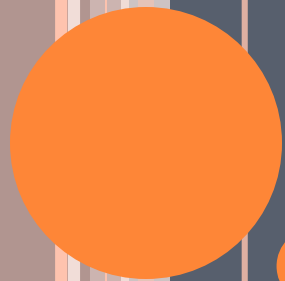
%	jet1	jet2	jet3	jet4	jet5	jet6
NN	86.3	84.0	85.3	81.1	83.4	82.7
Durham	79.8	72.9	74.0	72.8	70.3	72.2

MASS RESOLUTION

- Durham: direction matching of b-jets with MCTruth is imposed ($\cos \theta > 0.9$)
 - ~ 7000 events
- NN: χ^2 mass constraint is imposed by trying all the jet combination (90 combinations)
 - 300 events same as training sample
 - Do not use b-tagging



- Higher assignment efficiency is necessary ($> 90\%$?)
- Or, idea to suppress higher mass region of Higgs (lower of Z)?
- Better comparison plot is necessary
 - In same status

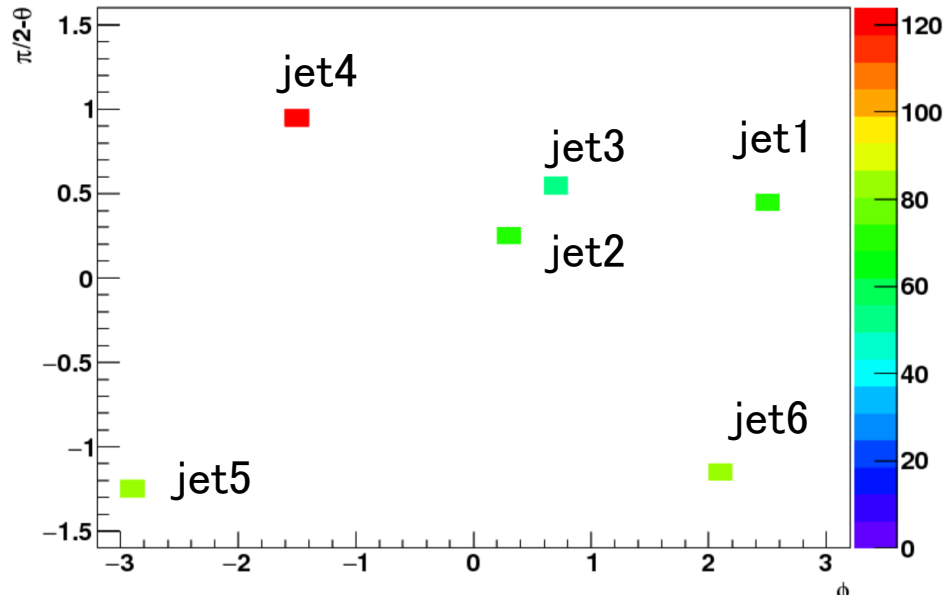


BACKUPS



NOTATION

- Numbering jets: counter-clockwise direction on $(\phi, \pi/2 - \theta)$ plane



- Create jets: perfect Durham jet clustering

