



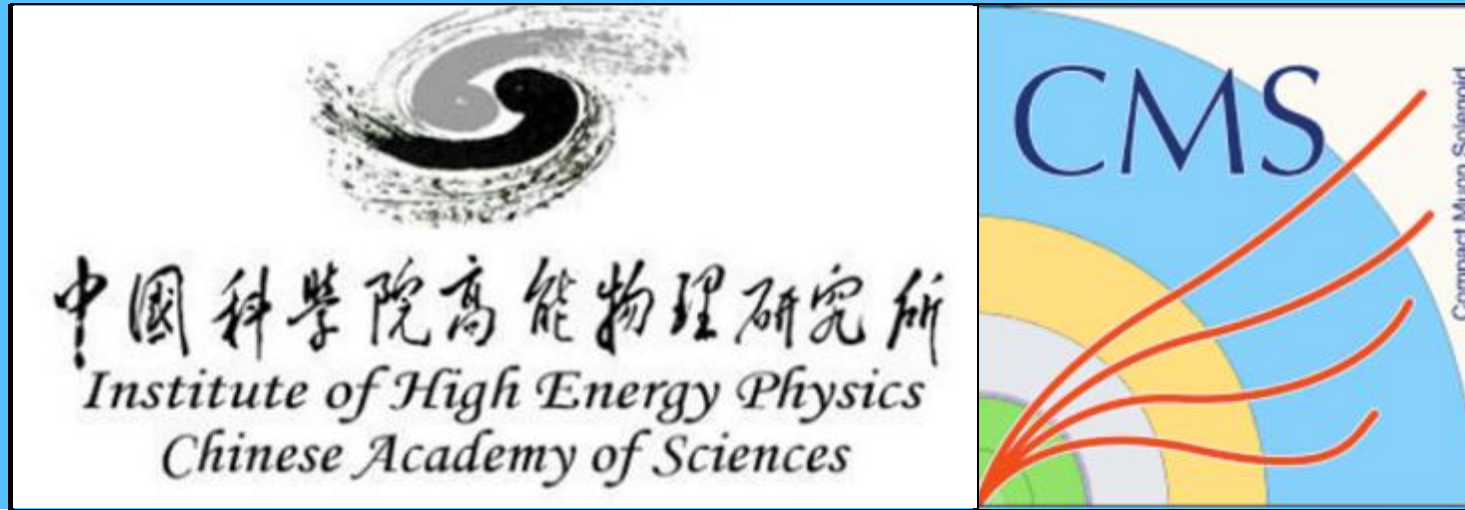
中国科学院高能物理研究所
Institute of High Energy Physics
Chinese Academy of Sciences



IHEP 9-12月考核

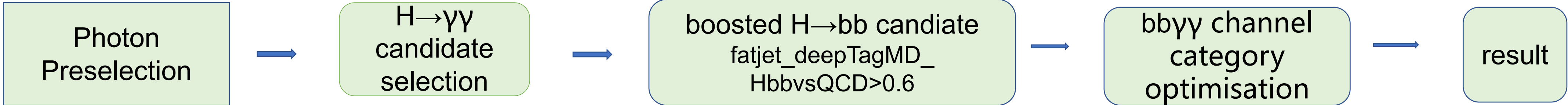
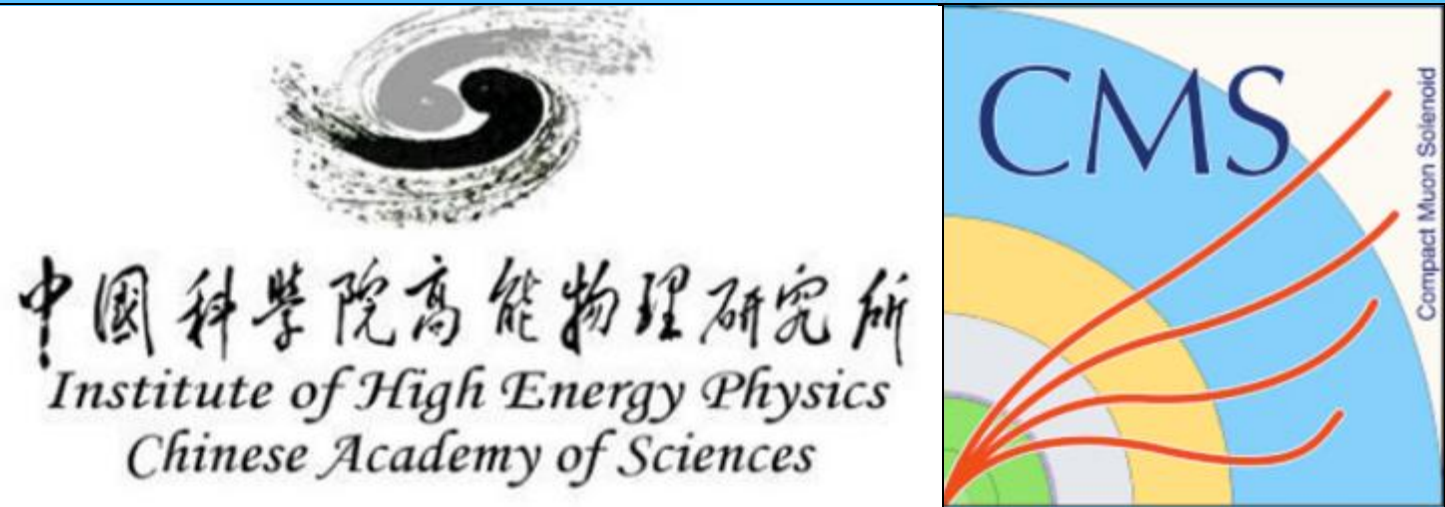
报告人：张杰
导师：王锦

Outline



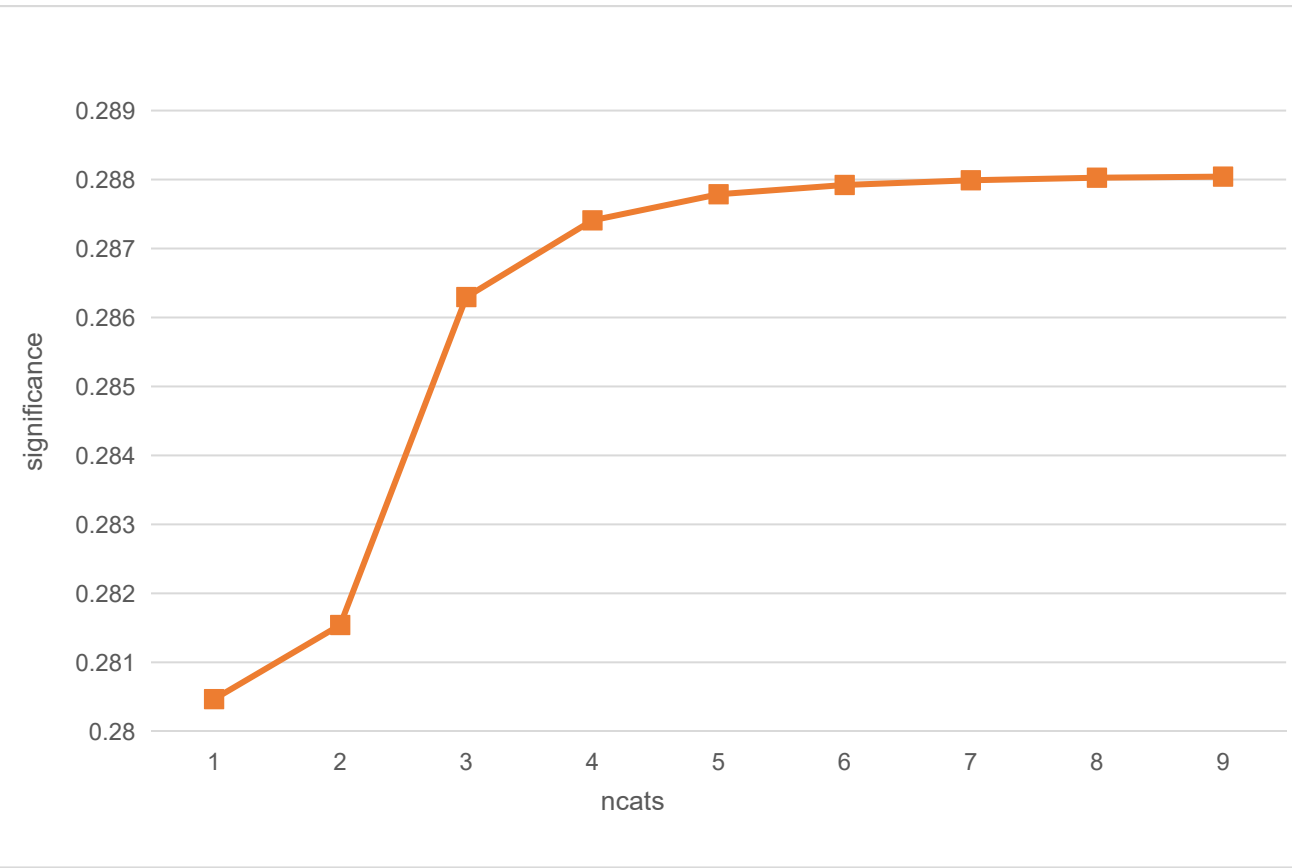
- * Resonant boosted $HH \rightarrow b\bar{b}\gamma\gamma$ analysis
- * Resonant $HY \rightarrow b\bar{b}\gamma\gamma$ analysis
- * HGCAL bonding
- * Summary

boosted $HH \rightarrow b\bar{b}\gamma\gamma$

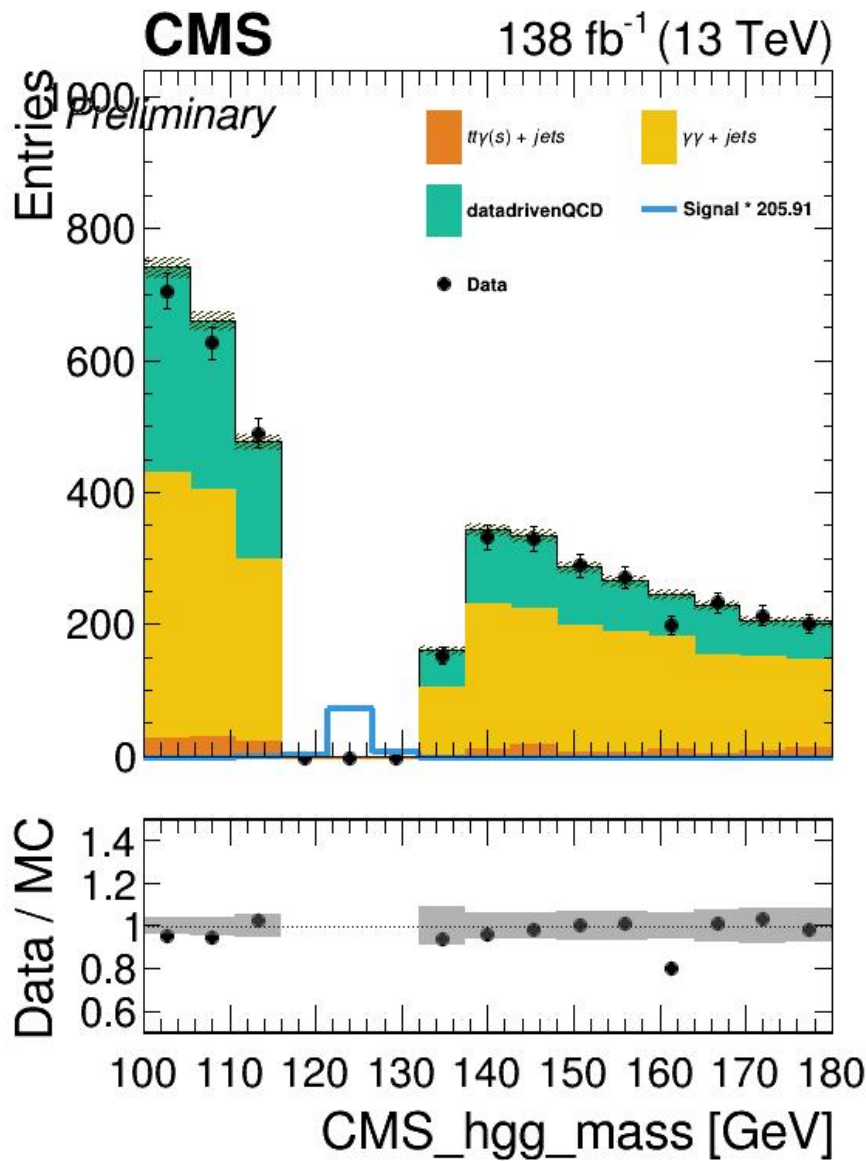
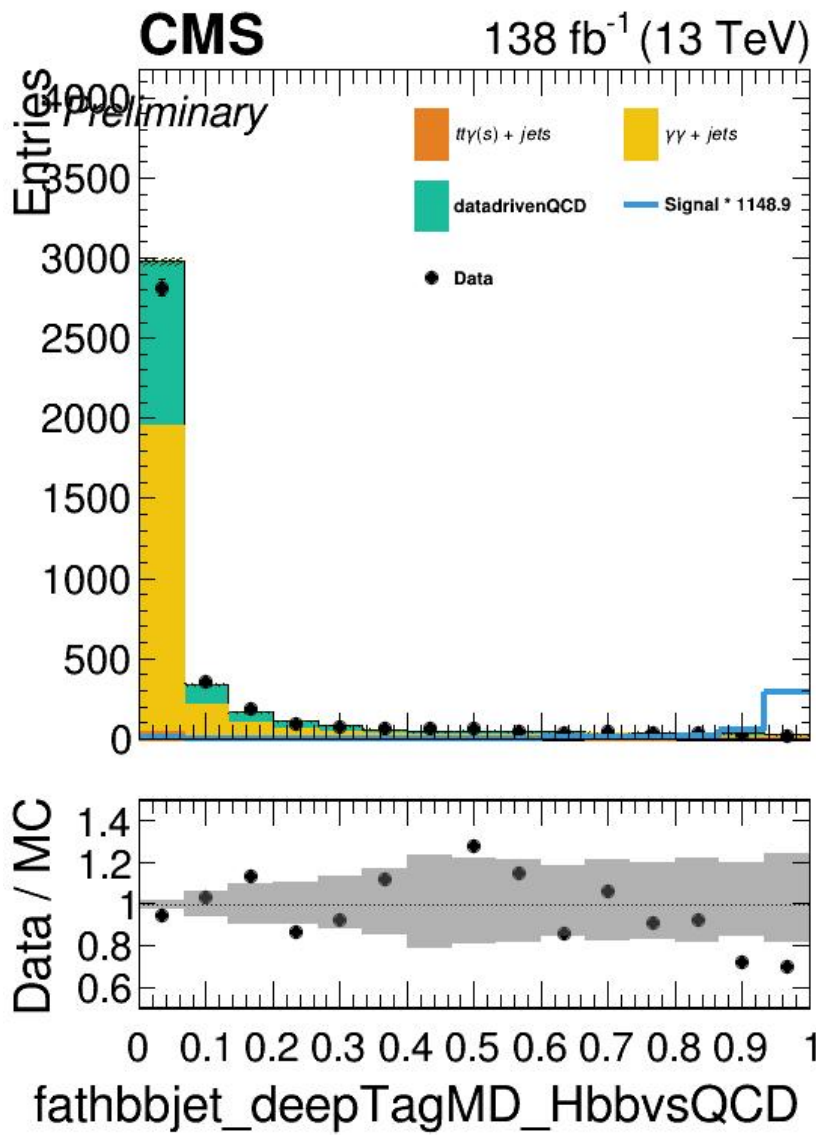


Full-RunII Data samples;
5 mass points for signal analysis:1000Gev-3000Gev;
main background:QCD(Data-driven) + DiphotonJets.

$$\text{significance} = \sqrt{2((S+B)\ln(1+\frac{S}{B}) - S)}$$

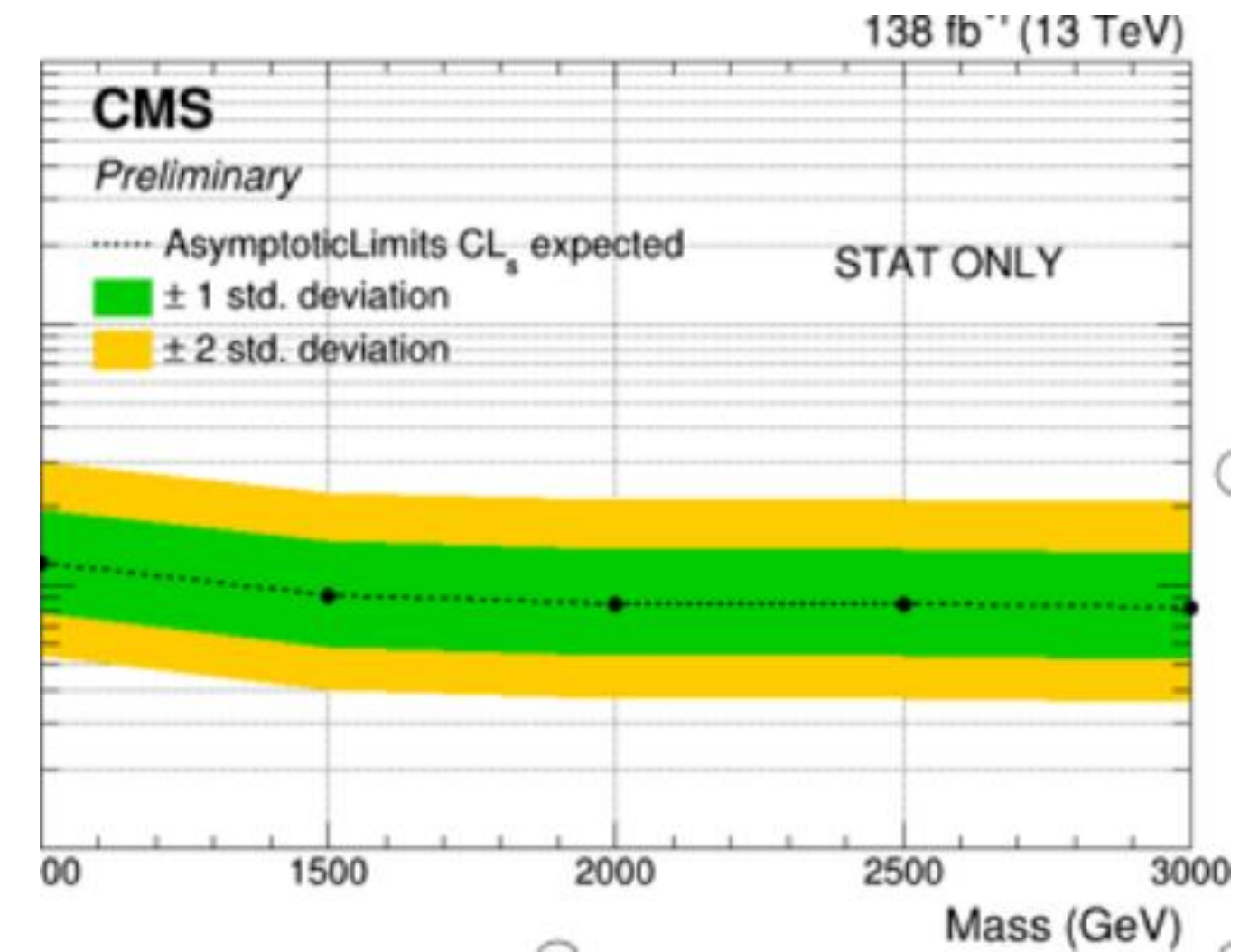
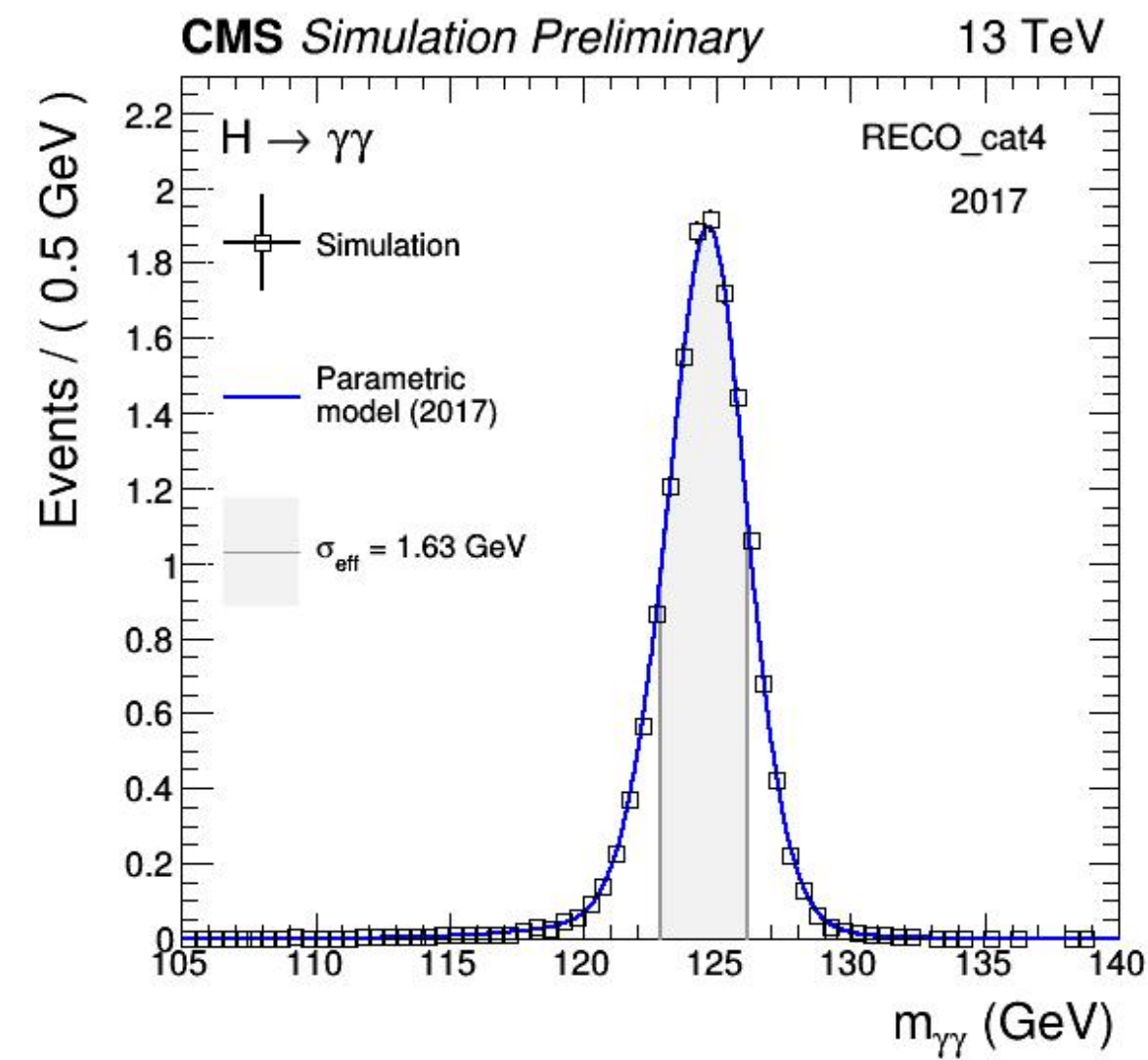
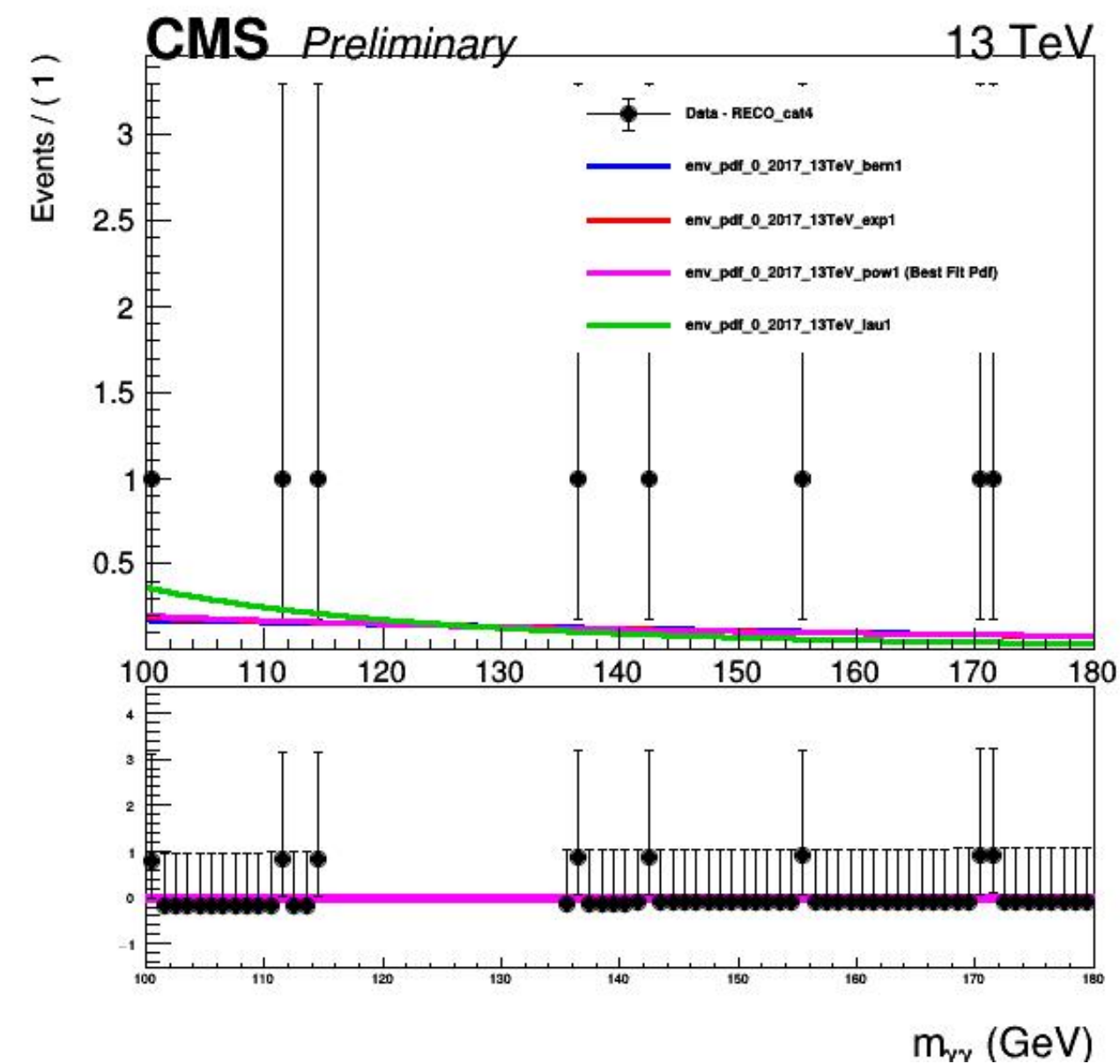


cuts=[0.6,0.85,0.91,0.94,0.96,1]



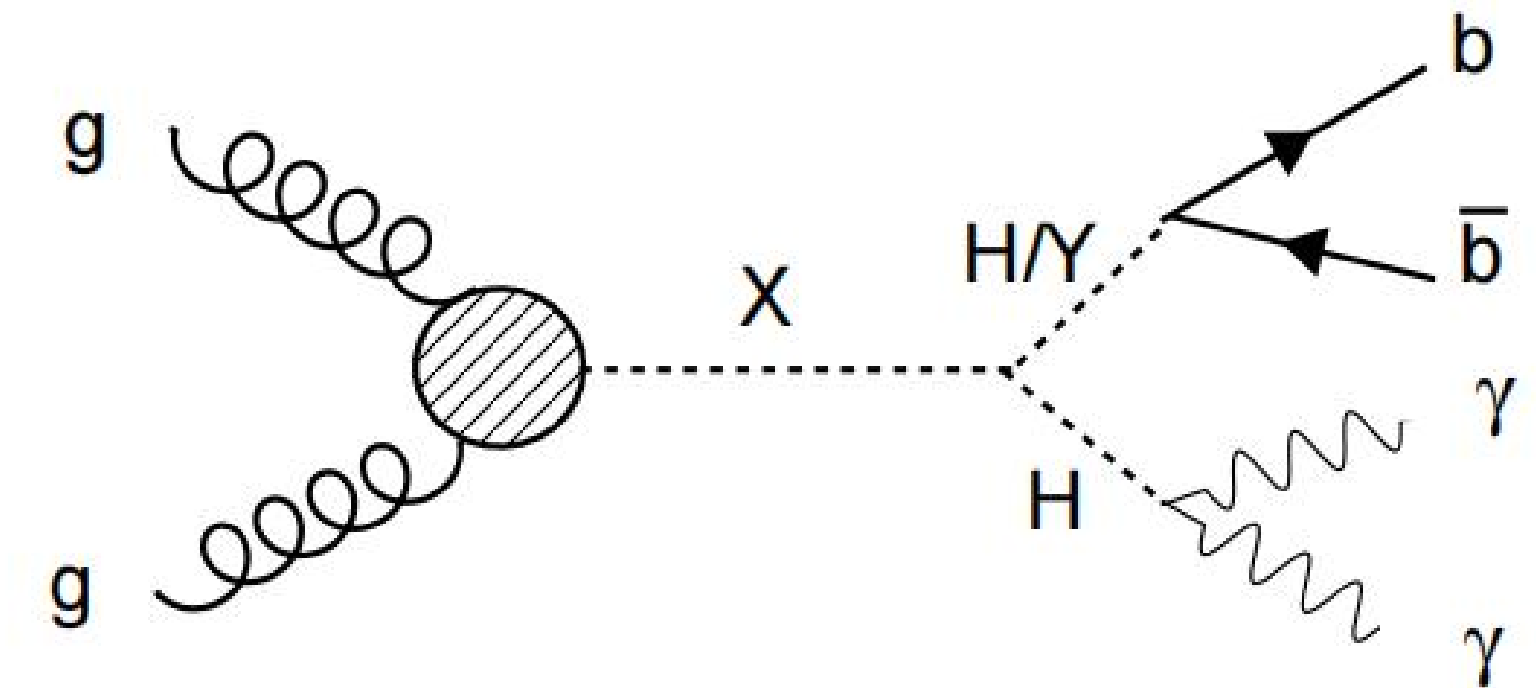
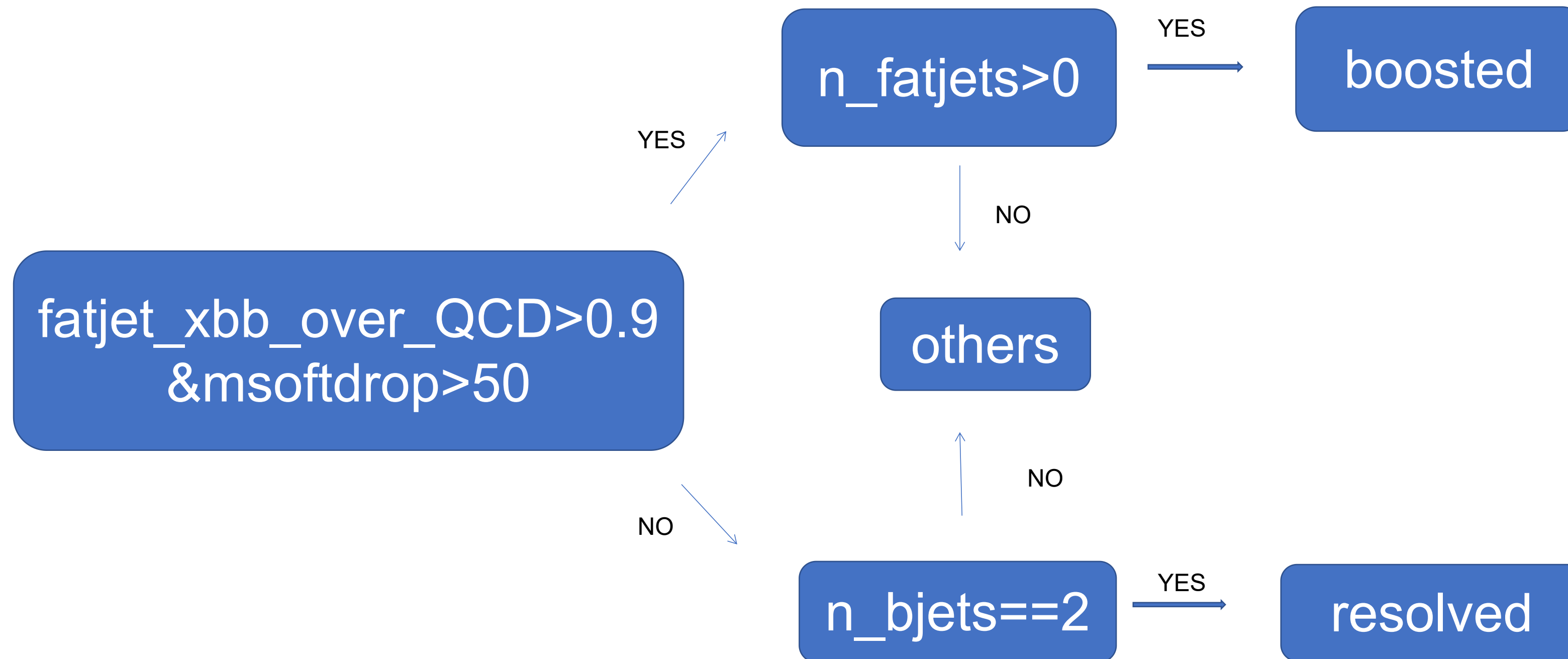
boosted $HH \rightarrow bb\gamma\gamma$

Background and Signal models, used flashggFinalFit:

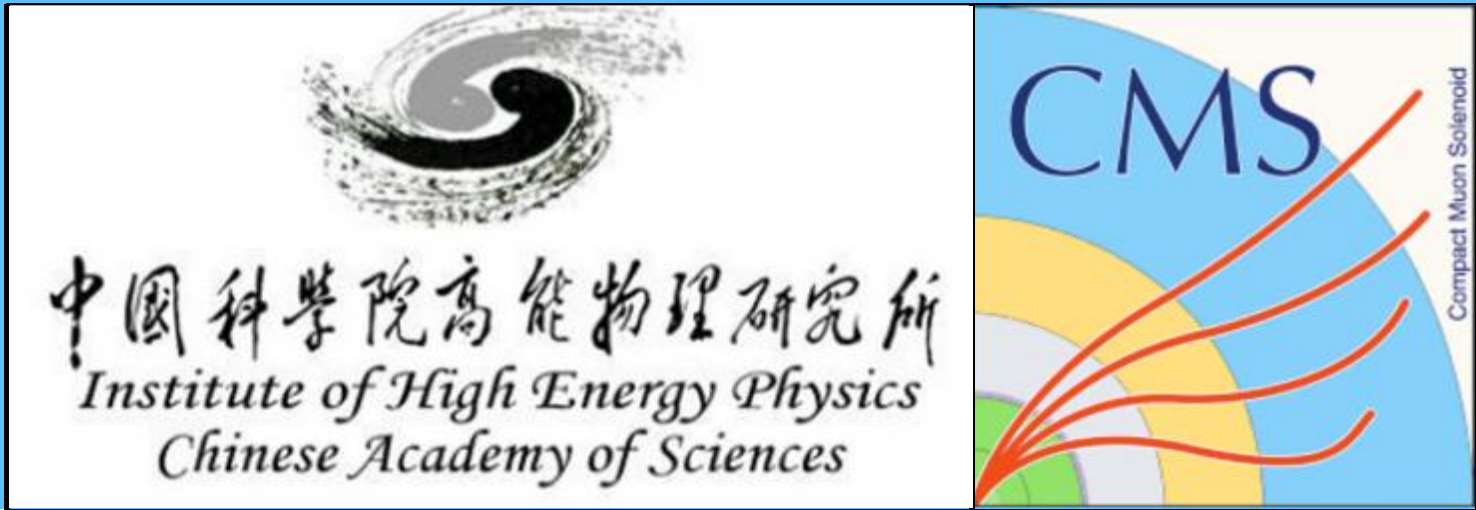


Background and Signal fit in most sensitive cat

$HY \rightarrow bb\gamma\gamma$



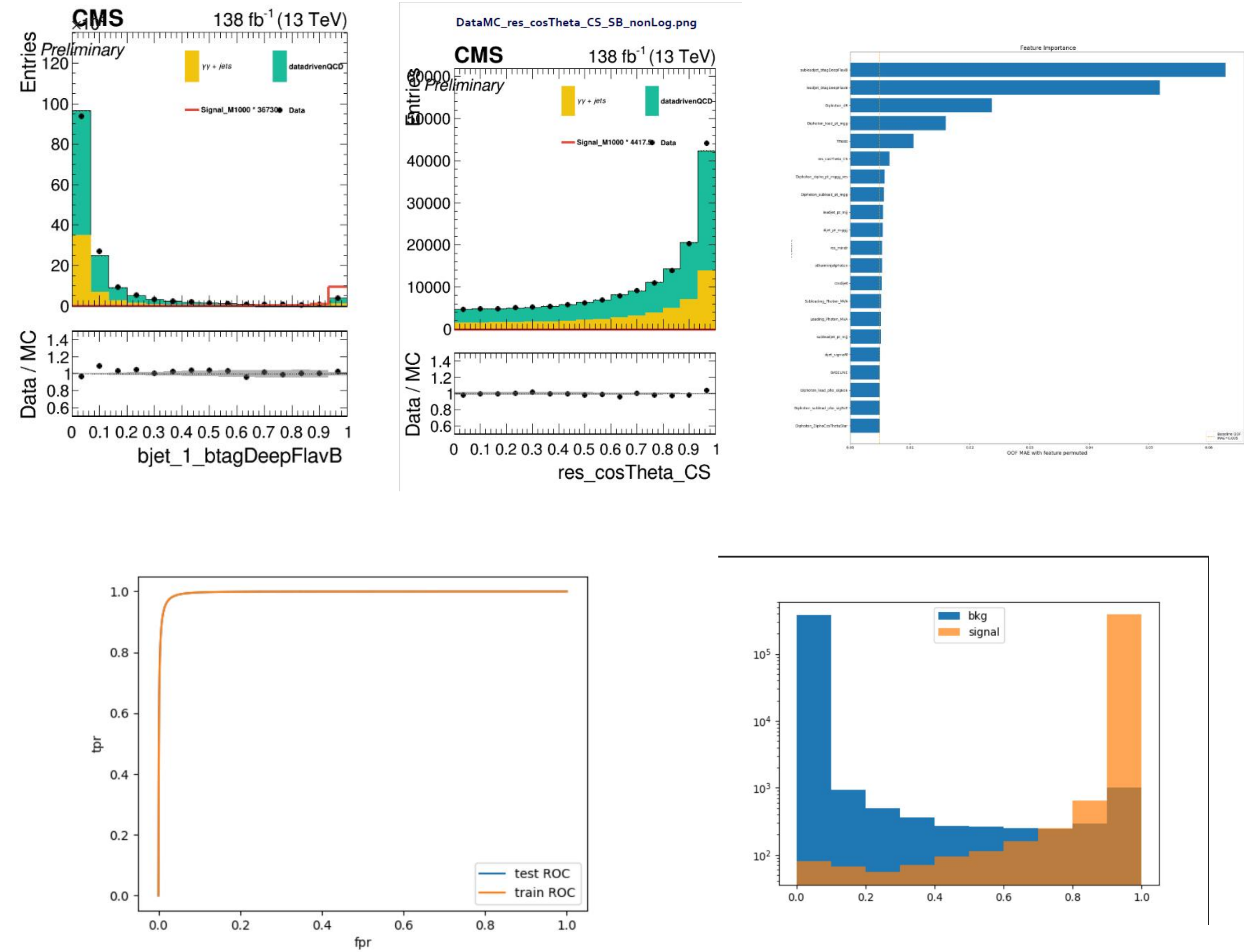
HY→bbγγ



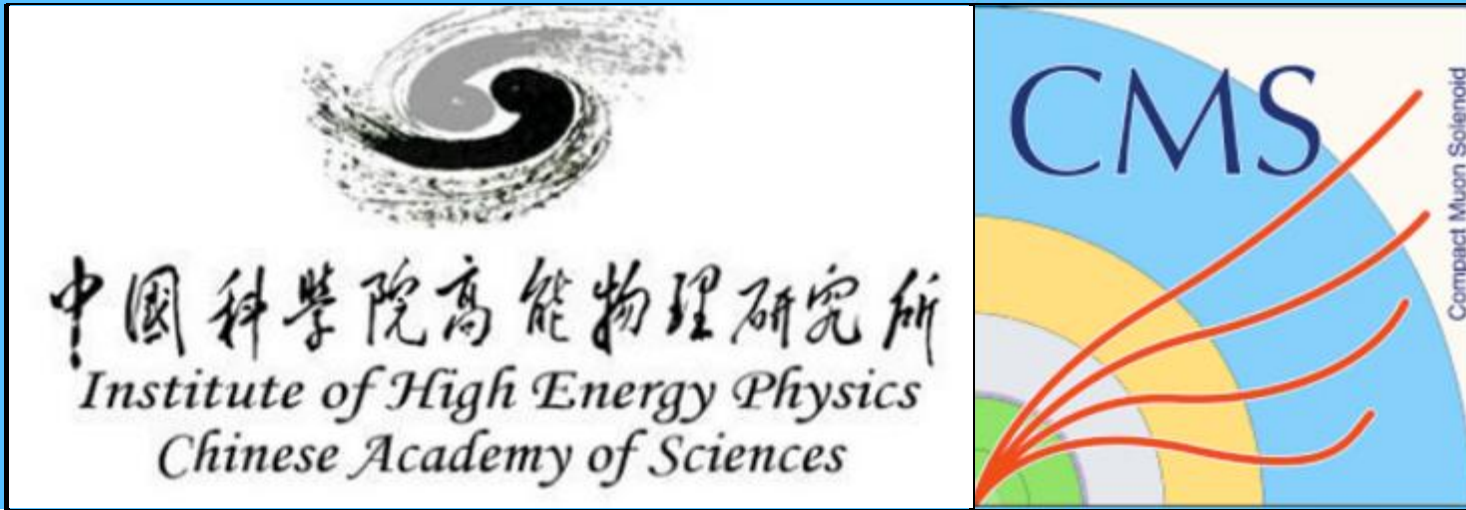
p^r/m_{rr} p^i/m_{jj}	Diphoton_lead_pt_mgg Diphoton_sublead_pt_mgg leadjet_pt_mjj subleadjet_pt_mjj
p^r/m_{rrjj} p^i/m_{rrjj}	Diphoton_dipho_pt_mggjj_res dijet_pt_mggjj
costhta	res_cosTheta_CS(dijet与diphoton) Diphoton_DiphoCosThetaStar cosdijet
deltaR	res_mindr otherminjetphoton
b tagging	leadjet_btagDeepFlavB subleadjet_btagDeepFlavB
photon id	Leading_Photon_MVA Subleading_Photon_MVA
object resolution	Diphoton_lead_pho_sigEoE Diphoton_sublead_pho_sigEoE leadjet_bRegRes subleadjet_bRegRes dijet_sigmoM

DNN input [HIG-19-018](#)

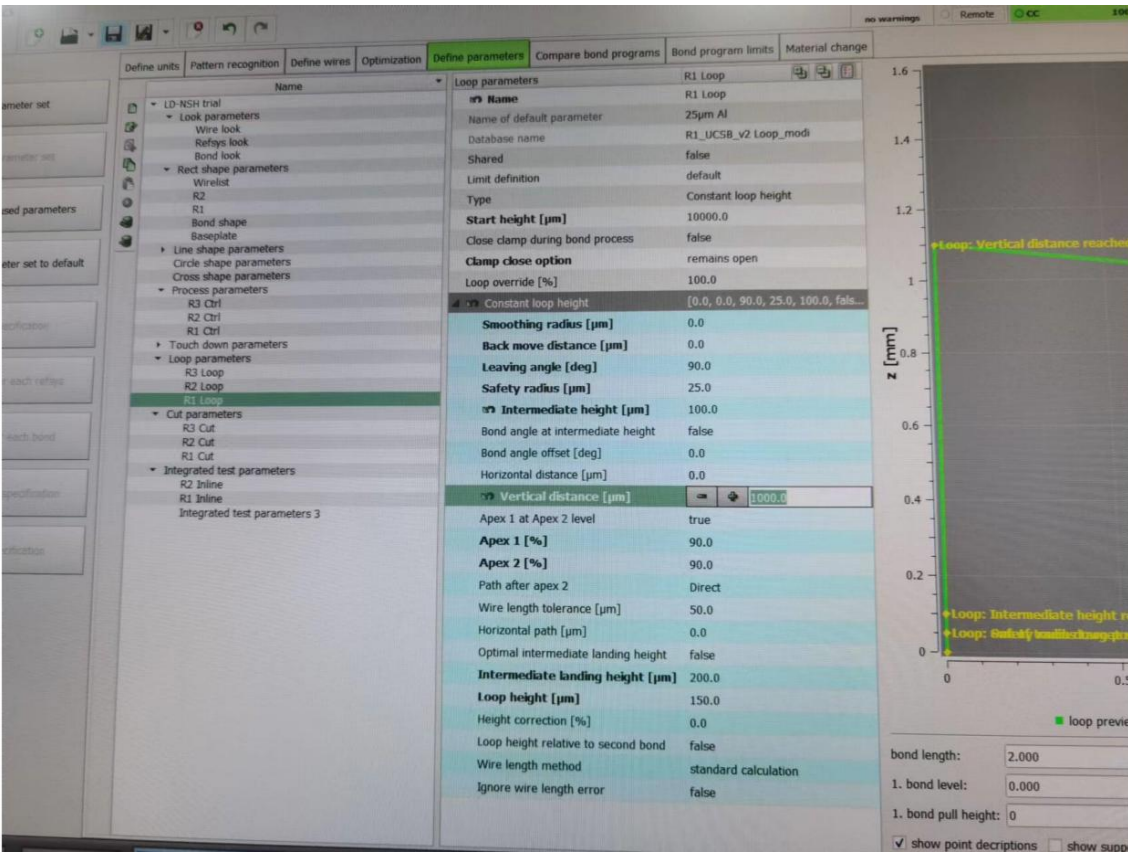
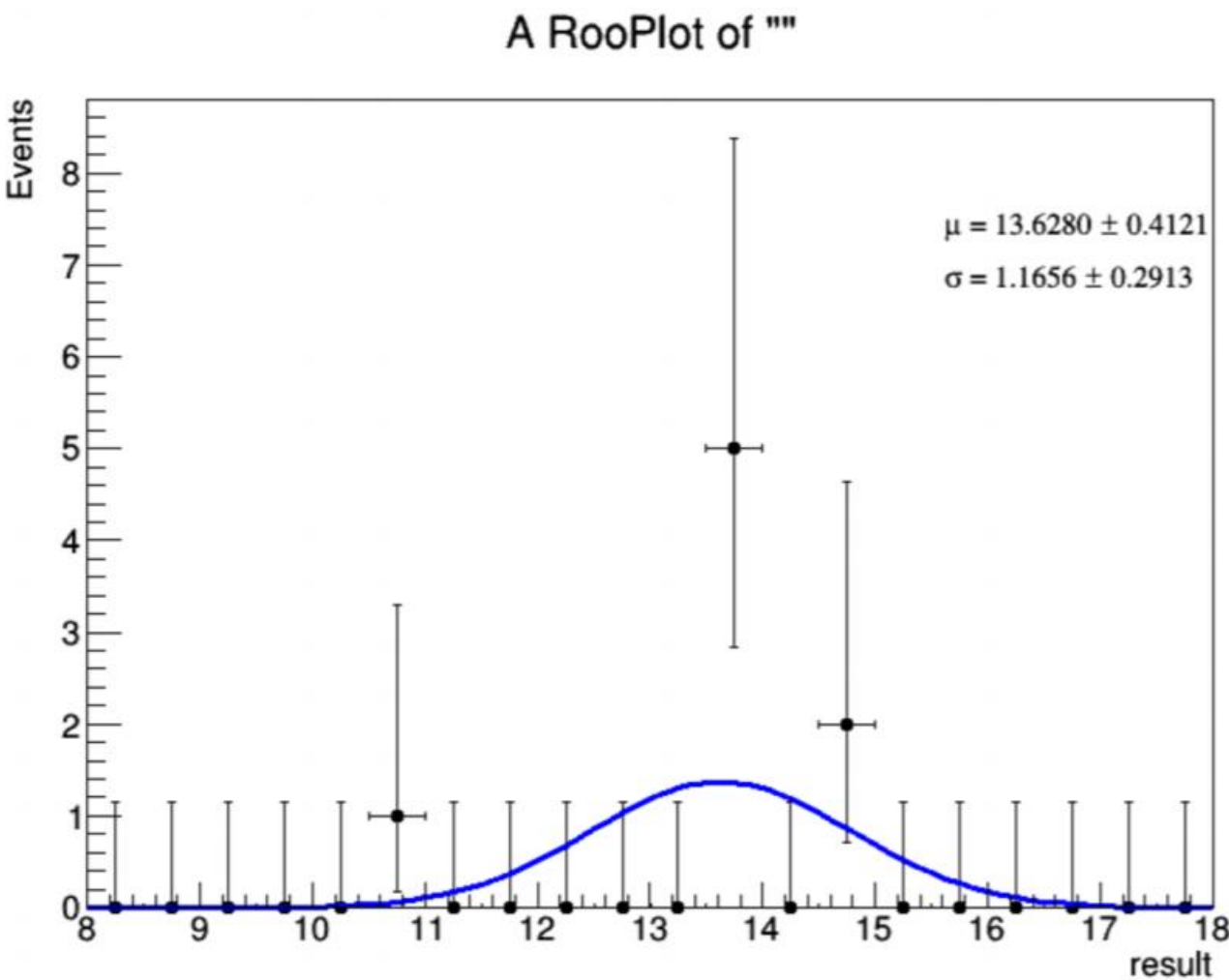
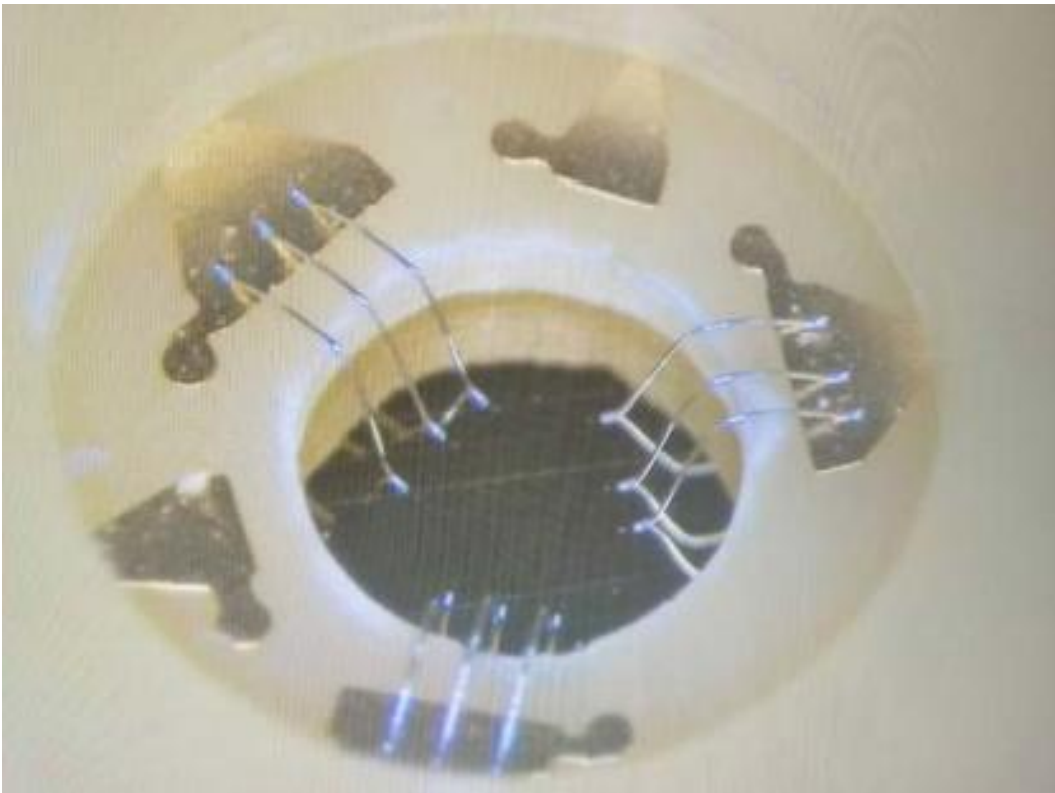
For boosted :like HH analysis,we
plan to apply cut-based analysis
strategy



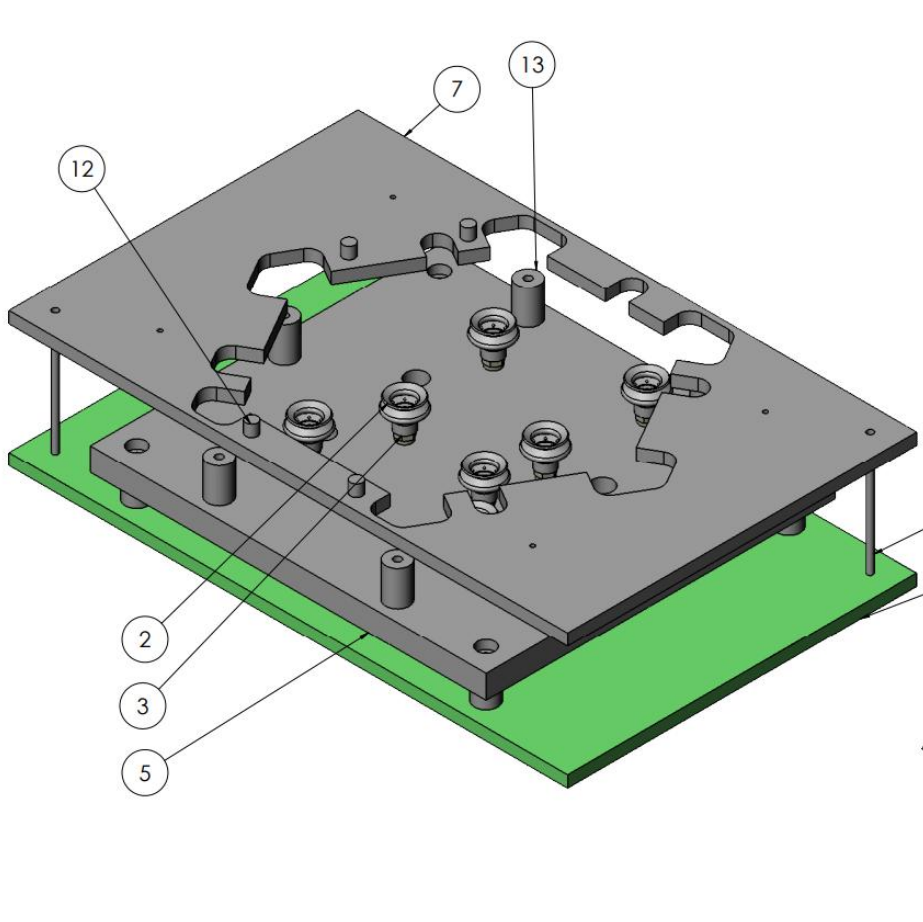
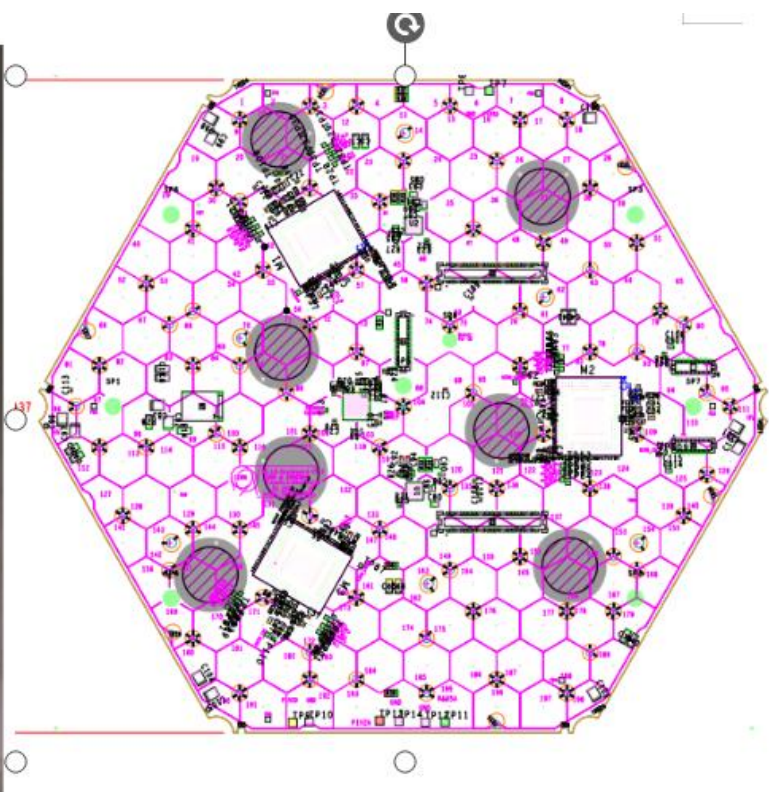
HGCal bonding



Bonding practice : learn to use bonding,familiarity with the overall process, do some pull test

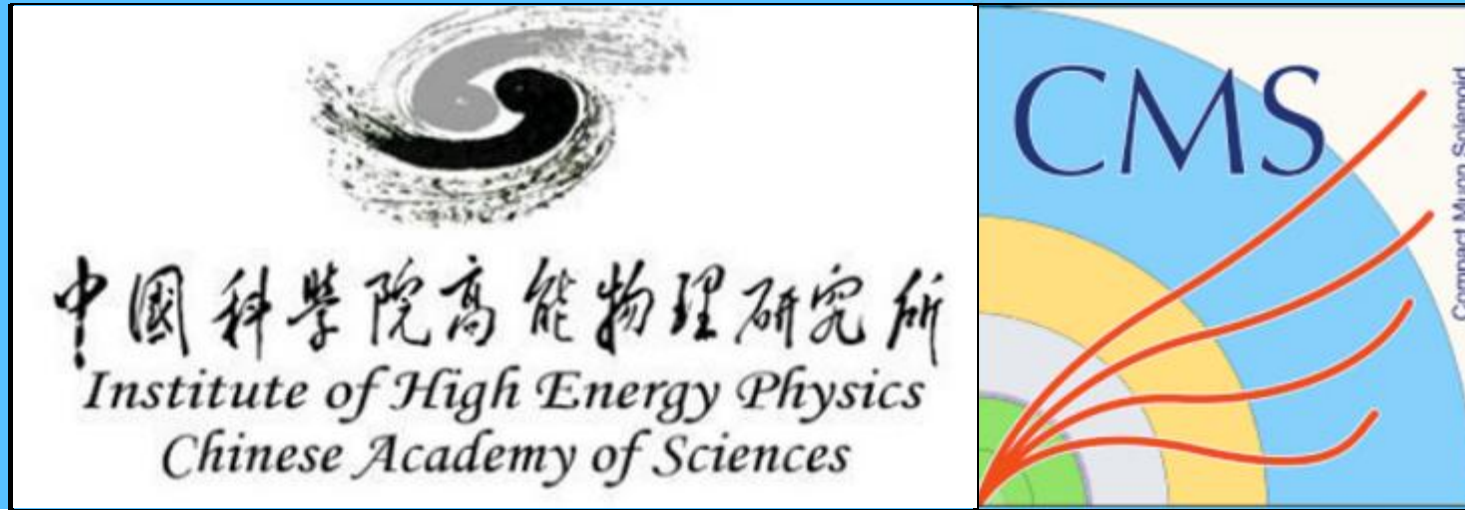


Compare the difference,change v2 to v3,add the new v3 program,new fixture need to be produced.



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	backbond base		1
2	lower.com-81.5-30-DEP AUL		7
3	lower.com-21700205 fitting	VACUUM CUP FITTING	7
4	1-8 Dowel pin-2	1/8 x 2.25" long dowel pin	2
5	V3 LD backbond vacuum block	Carrier Plate LD V3 1.2 back bond	1
7			1
12	PTE dowel pin		4
13	McMaster 9333SA641	10-32 threaded spacer	6
14	5454K79	MINIATURE TEE FITTING	6
15	McMaster 5454K62	MINIATURE BRASS TUBE FITTING	13
16	McMaster 92510A745	unthreaded spacer for #10 screw	4
17	5454K78	MINIATURE ELBOW FITTING	1

Summary



Analysis of HH/HY:

- We have got preliminary result for HH analysis

- We have determined the analysis stratege for HY analysis

- Plan to include all systematic uncertainties and complete HH/HY analysis in 2023

HGCal bonding:

- Waiting for the production of the fixture

- Do some test with new module

Thanks!