

All-Hadronic Channel Analysis

TAN MAN HONG

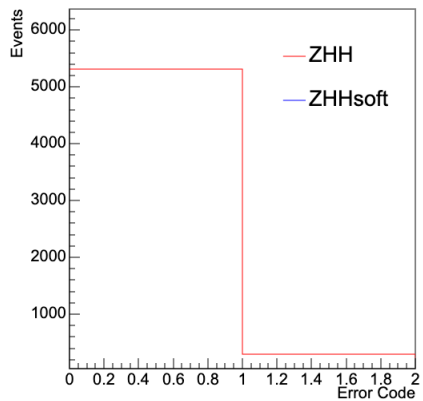
Work Progress Update on 8th April 2026

Work Updates

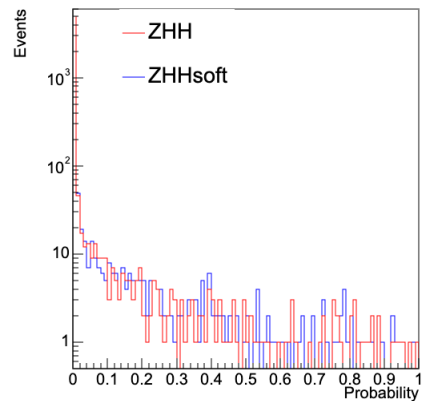
- Debugging on ZHH and ZZH hypo
 - Identified and fix problem with permutation algorithm
- Integrated soft mass constraint (ZHHsoft & ZZHsoft)
- Attempt to implement a B-tags cut
- Ttbar hypo in progress

Results – ZHH Hypo with 3 Mass Constraints

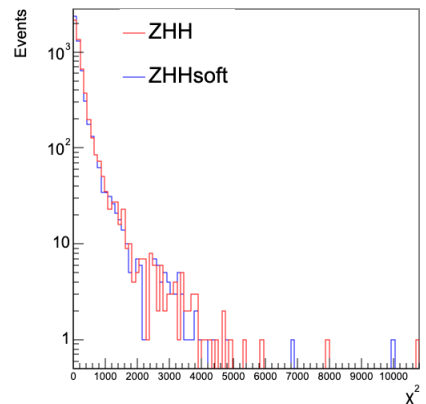
Fit Error Code



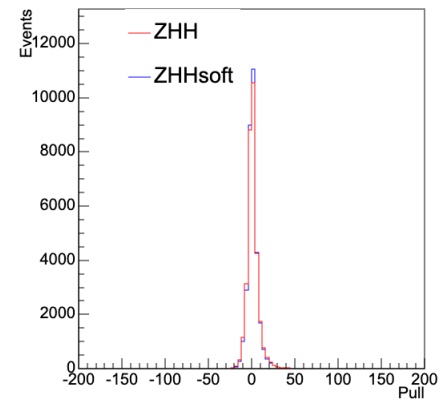
Fit Probability



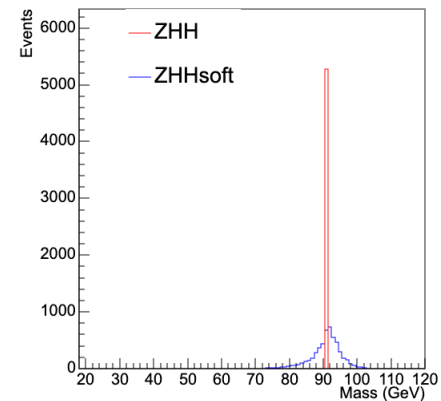
Fit Chi2



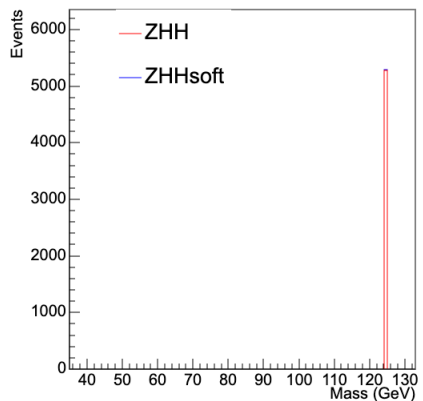
Jet Energy Pull



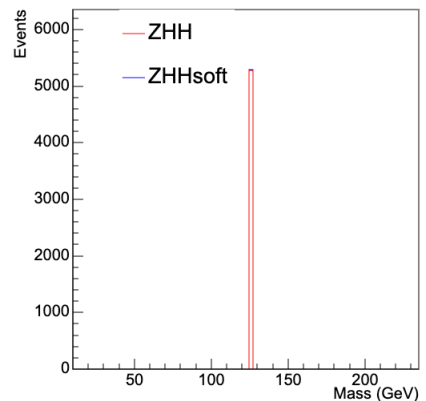
Z Mass



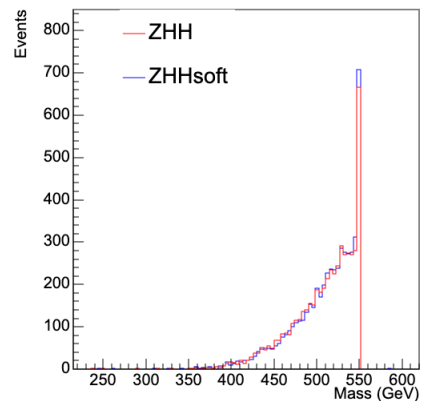
H1 Mass



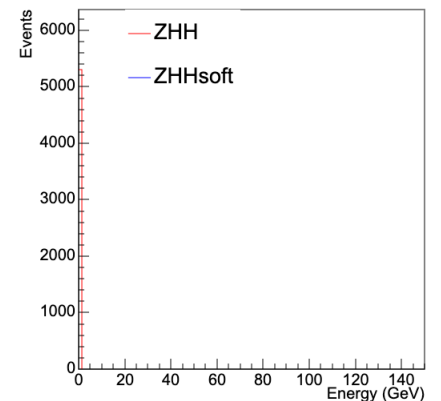
H2 Mass



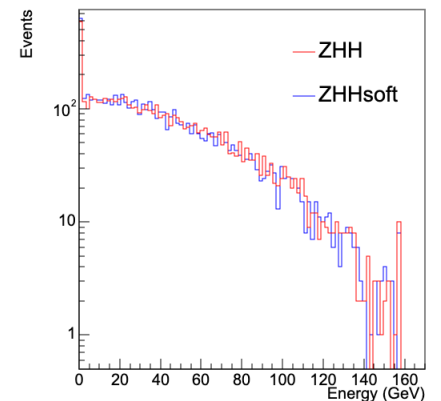
ZHH Mass



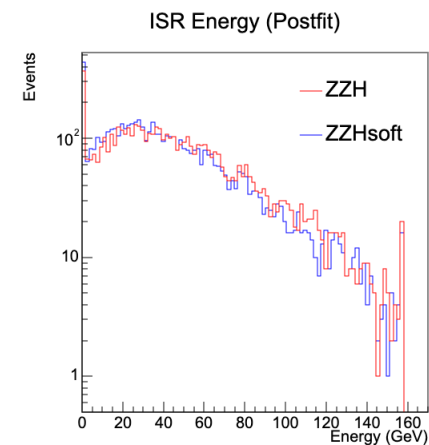
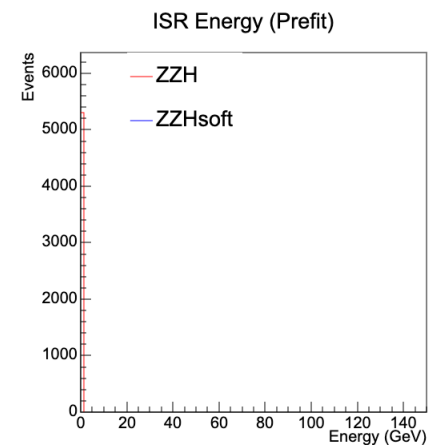
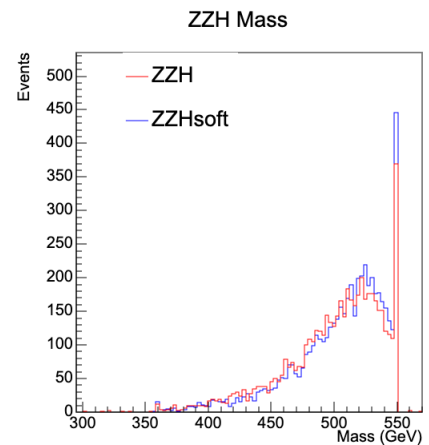
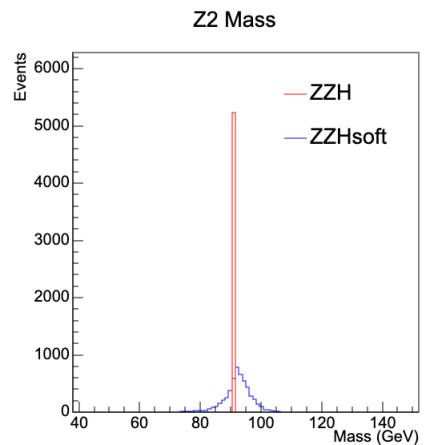
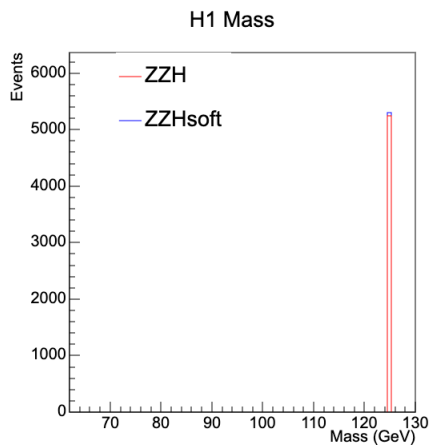
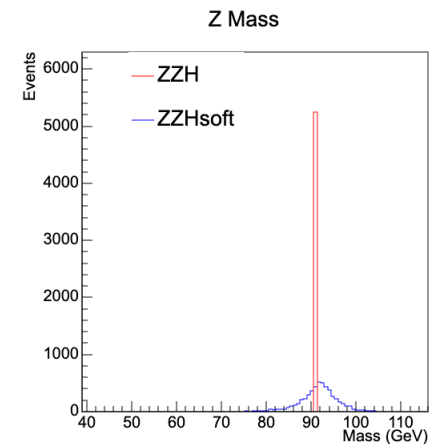
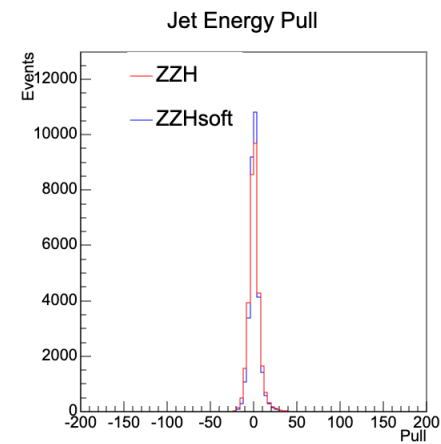
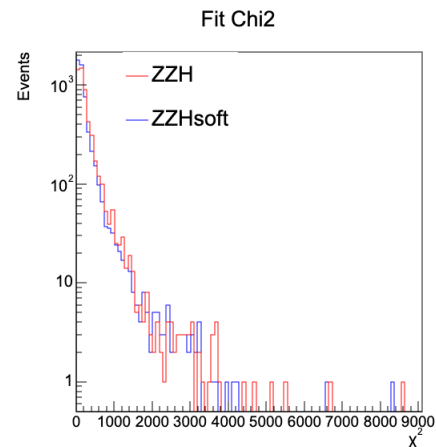
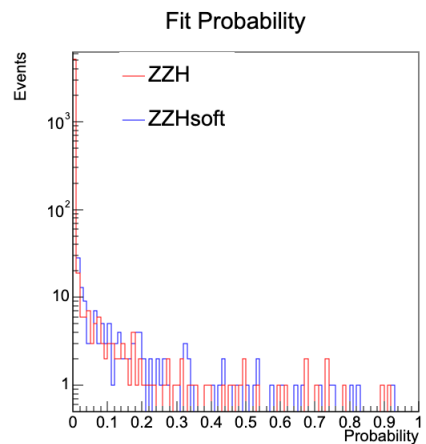
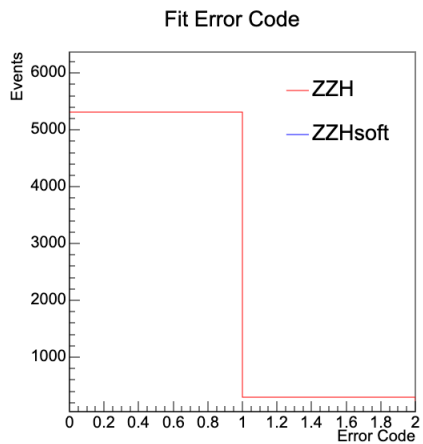
ISR Energy (Prefit)



ISR Energy (Postfit)



Results – ZZH Hypo with 3 Mass Constraints



Results – B-tags

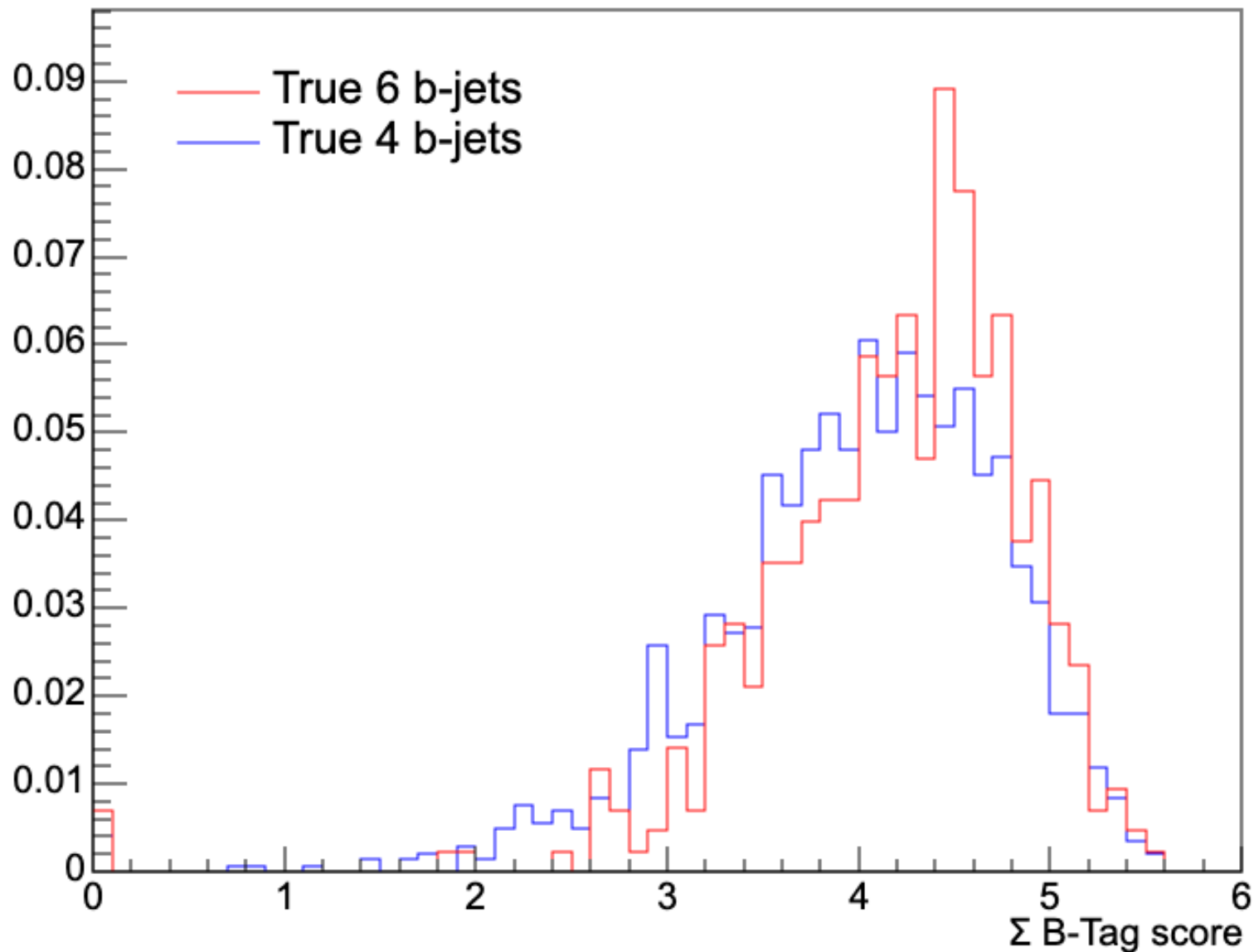
- Issues:

- Underwhelming sum of 6 b-jets score.
- Conservation violation

```
*****  
*   Row   * Instance * final_sta *   event *  
*****  
*     24 *         0 *        -5 *     25 *  
*     24 *         1 *         5 *     25 *  
*     24 *         2 *         5 *     25 *  
*     24 *         3 *         5 *     25 *  
*     24 *         4 *         5 *     25 *  
*     24 *         5 *         5 *     25 *  
*****
```

PID	P Count	Pbar Count
1	1215	1215
2	897	897
3	1261	1251
4	1555	953
5	14252	1284
13	2	0
15	1382	0
21	1798	0
22	87	0
23	663	0
24	4888	0

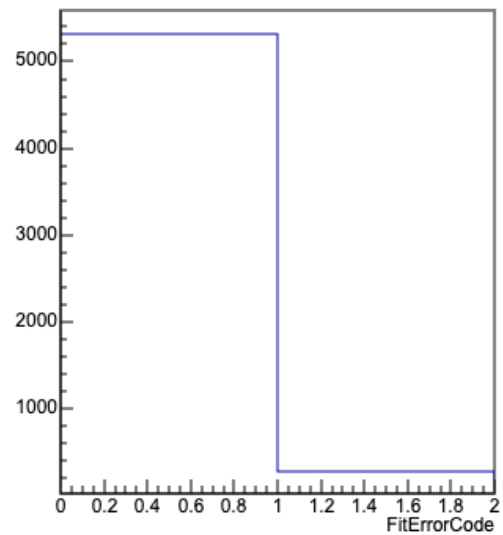
Sum of B-Tags



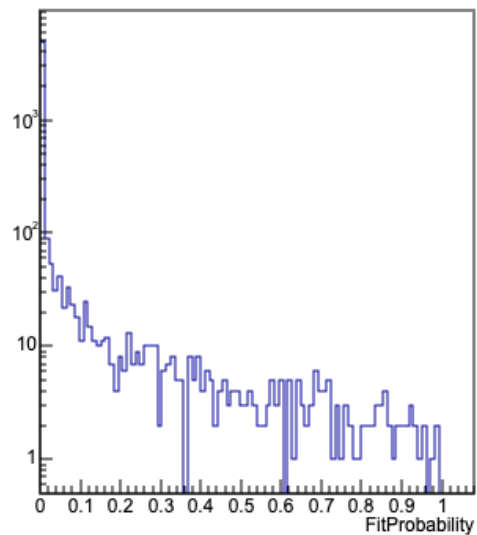
Backups

Results – ZZH

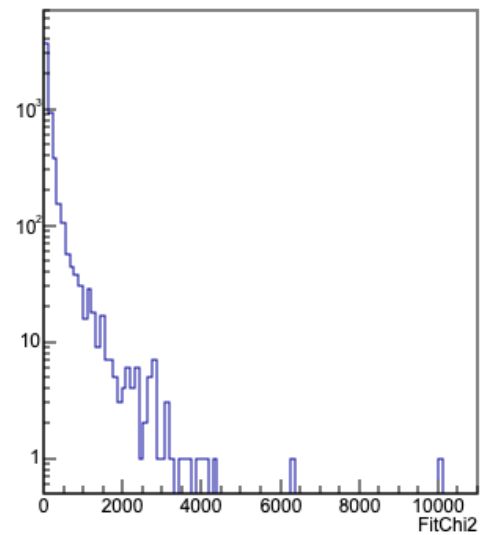
FitErrorCode



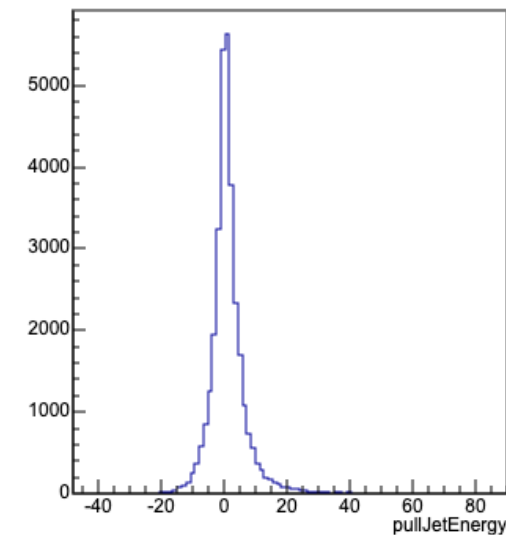
FitProbability



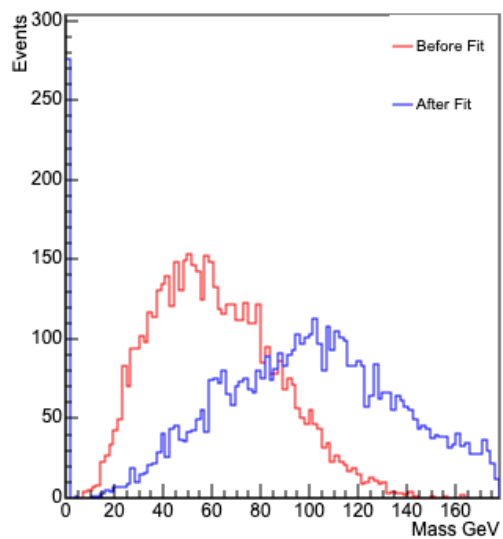
FitChi2



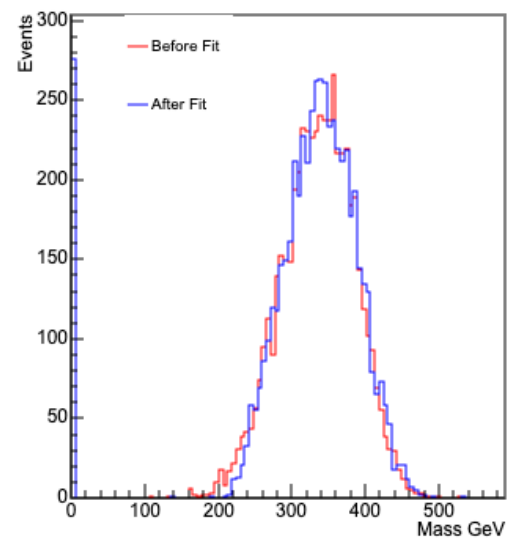
pullJetEnergy



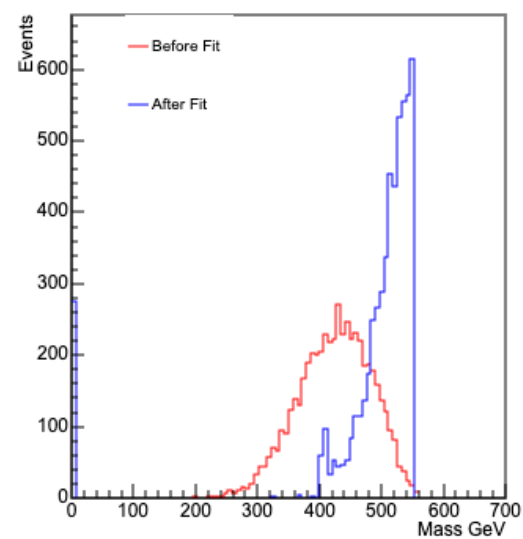
Z Mass



HH Mass

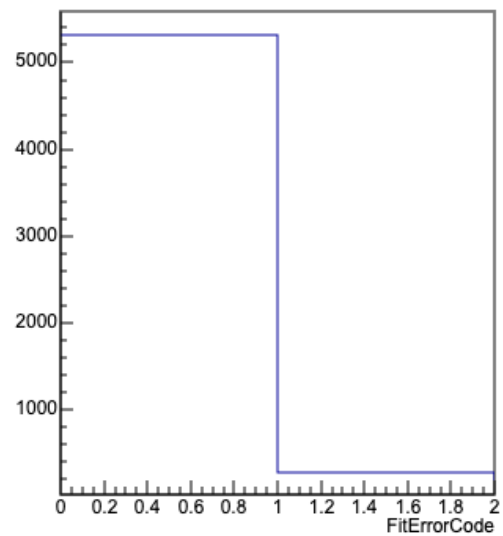


ZHH Mass

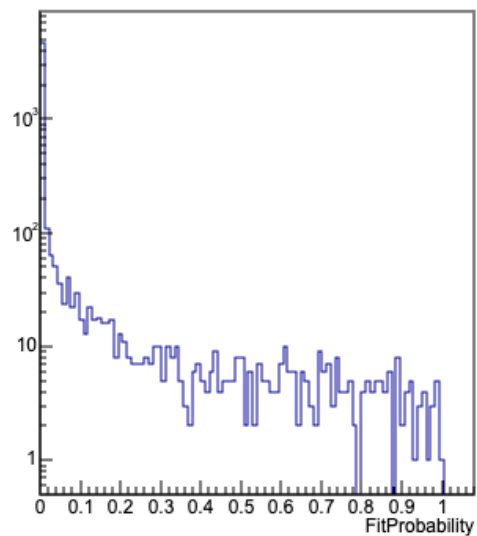


Results – ZHH

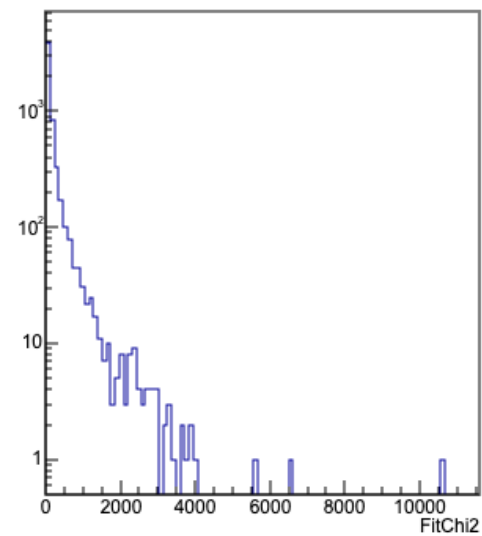
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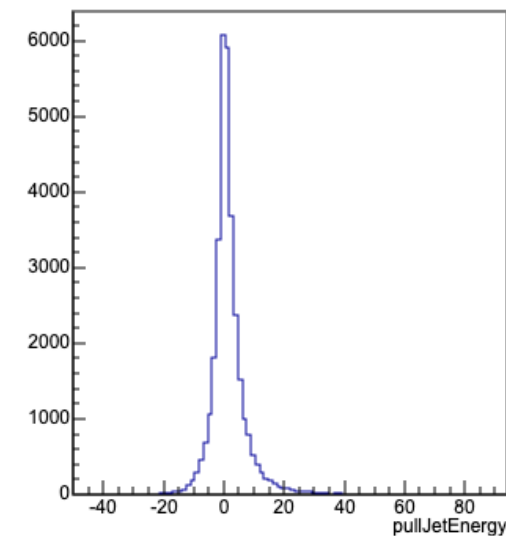
FitProbability



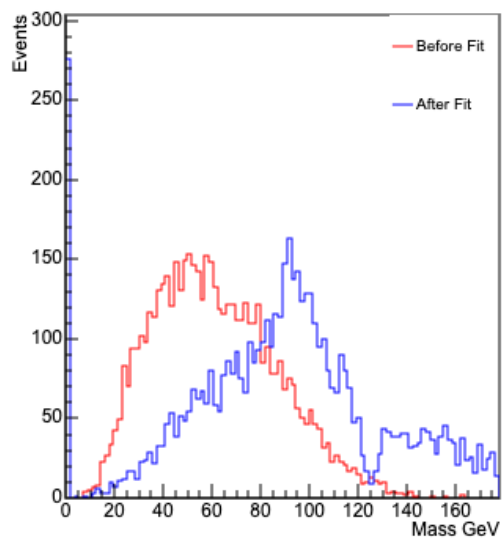
FitChi2



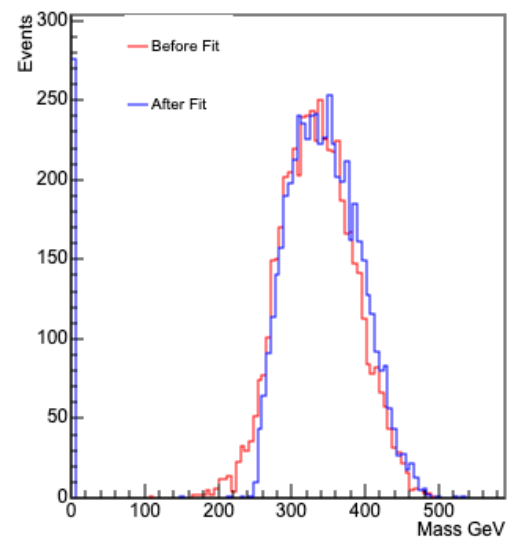
pullJetEnergy



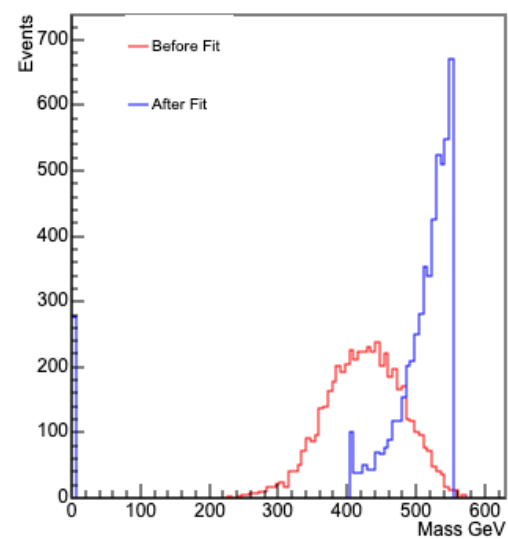
Z Mass



HH Mass

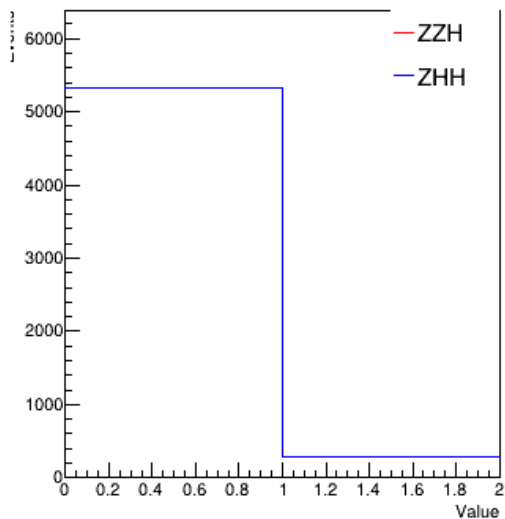


ZHH Mass

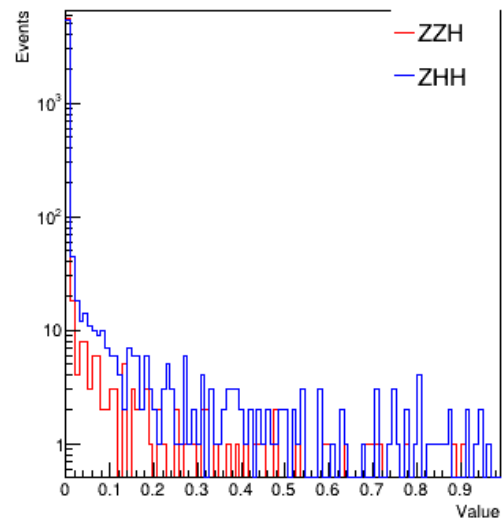


Results – 3x Mass Constraint (ZZH/ZHH)

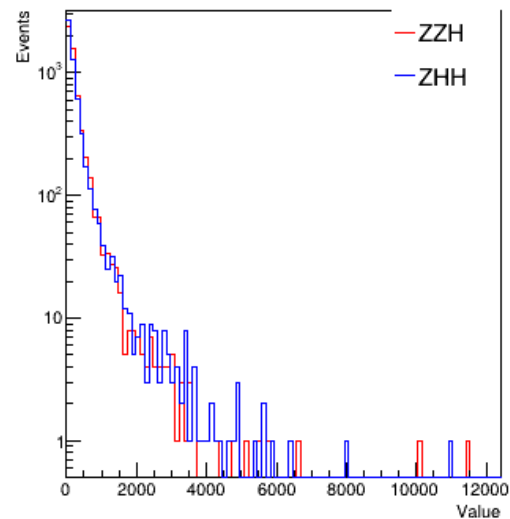
Fit Error Code



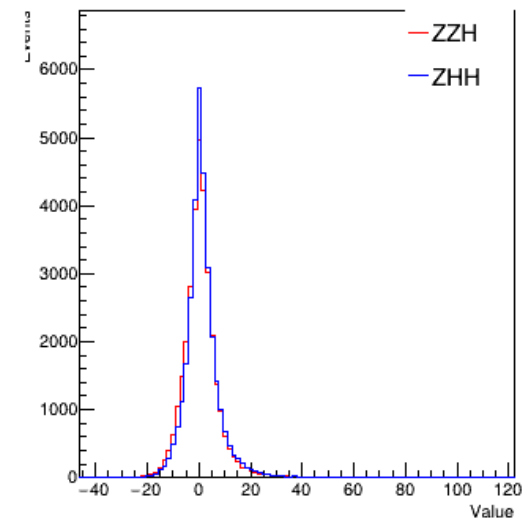
Fit Probability



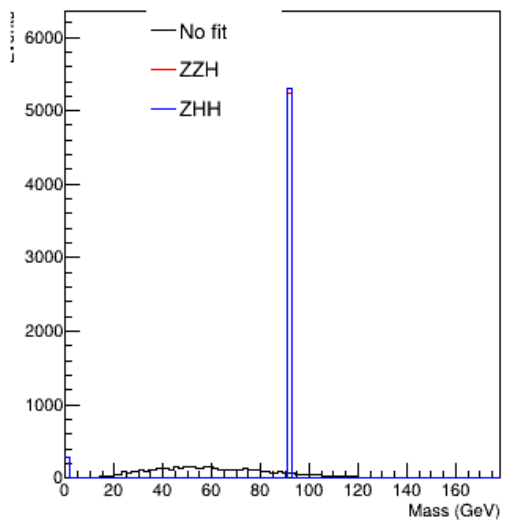
Fit Chi2



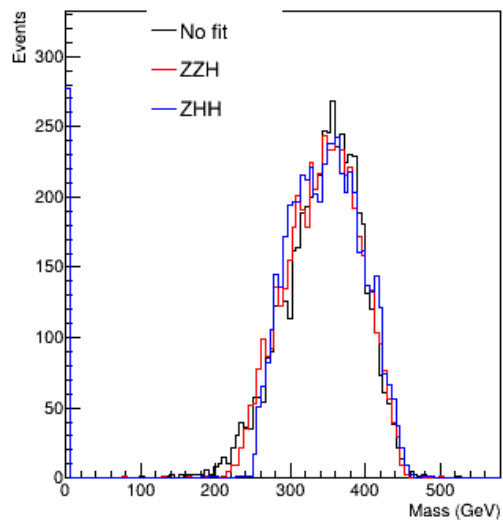
Jet Energy Pull



Z Mass



HH Mass



ZHH Mass

