

plan



中国科学技术大学
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For isobar hypernuclei (maybe about 1 month?)

1. Try to save anti-hypertriton properly
2. Learn to generate background by rotation to extract signal
3. Learn to use embedding data to help optimize the cuts

For curricula

1. Read books about “Advanced Quantum Mechanics” and “particle physics”, to name a few, “A modern introduction to particle physics, Riazuddin”, “Topics in advanced quantum mechanics, B.R.Holstein”, “高等量子力学，喀兴林”



- Isobar pico:

/star/u/suyuann/pwg/Isobar.Blind/isobar_ana/picoRaw_phy_20220807.list

- QA code:

based on /star/u/suyuann/pwg/Isobar.Blind/isobar_QA/isobar_QA/

in /star/u/dsli/Isobar_hypernuclei/Isobar_QA/

~0.36M pico in list, complete jobs 989/1800 (2.4×10^9 event)

- Ana:

based on /star/u/xli/pwg/gpc_CSB/02_kfparticle/H4L

in /star/u/dsli/pwg/Isobarhypernuclei/02_kfparticle/H3L

~0.36M pico in list, complete jobs 1437/1800 (?? event)

reproduced mini-tree to include anti-hypertriton

Pid



sigma = 1.

| | | | | |
|----|----------|-----------|-----------|-----------|
| fl | 24.1588, | -1.18784, | 0.400274, | 0.0678065 |
| fm | 25.6723, | -1.21547, | 0.439636, | 0.0499675 |
| fh | 27.23, | -1.24832, | 0.484846, | 0.0306433 |

sigma = 1.5

| | | | | |
|----|----------|-----------|-----------|-----------|
| fl | 23.4162, | -1.17593, | 0.382587, | 0.0763662 |
| fm | 25.6723, | -1.21547, | 0.439636, | 0.0499675 |
| fh | 28.028, | -1.2668, | 0.509963, | 0.0201415 |

sigma = 2.0

| | | | | |
|----|----------|-----------|-----------|------------|
| fl | 22.6818, | -1.16524, | 0.366166, | 0.0847473 |
| fm | 25.6723, | -1.21547, | 0.439636, | 0.0499675 |
| fh | 28.8402, | -1.28672, | 0.537006, | 0.00886793 |

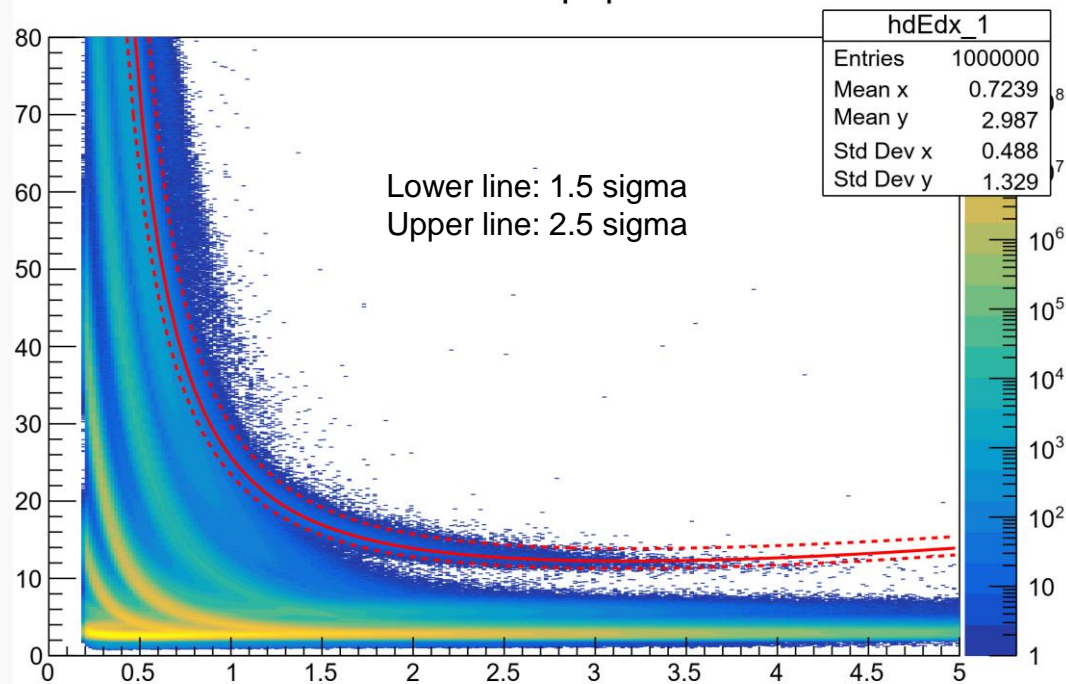
sigma = 2.5

| | | | | |
|----|----------|-----------|-----------|-------------|
| fl | 21.9547, | -1.15577, | 0.350995, | 0.0929808 |
| fm | 25.6723, | -1.21547, | 0.439636, | 0.0499675 |
| fh | 29.6677, | -1.30816, | 0.566214, | -0.00336088 |

sigma = 3.0

| | | | | |
|----|----------|-----------|-----------|------------|
| fl | 21.2389, | -1.14855, | 0.335103, | 0.104148 |
| fm | 25.6723, | -1.21547, | 0.439636, | 0.0499675 |
| fh | 30.5117, | -1.3312, | 0.597879, | -0.0167671 |

hdEdx vs p/q



Pid changed to :

Upper line: 2.5 sigma

Lower line: 1.5 sigma when $|p/q| < 1.5$
2.5 sigma when $|p/q| > 1.5$

Kfparticle reconstruction



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Use a micro to add cut

```
if (id < 0) continue;  
...  
if (mass < 2.92 || mass > 3.03) continue;  
if (ht_ldl < 4) continue;  
if (ht_l < 2.) continue; //2  
if (chi2ndf > 4.) continue;  
if (chi2primary_pi < 20.) continue;  
if (chi2primary_he > 500) continue;  
if (chi2topo > 3.) continue;
```

After chi2ndf and chi2topo cut, the peak around 2.99 emerges

Other cuts help to make the background more smooth, won't change too much

Binning:

```
TH1F* hmass = new TH1F("hmass", "hmass", 110, 2.92, 3.03);
```

