Test: Model dependence

Purpose: modify the input model at generator with extremely case to see the impact on extraction of nu

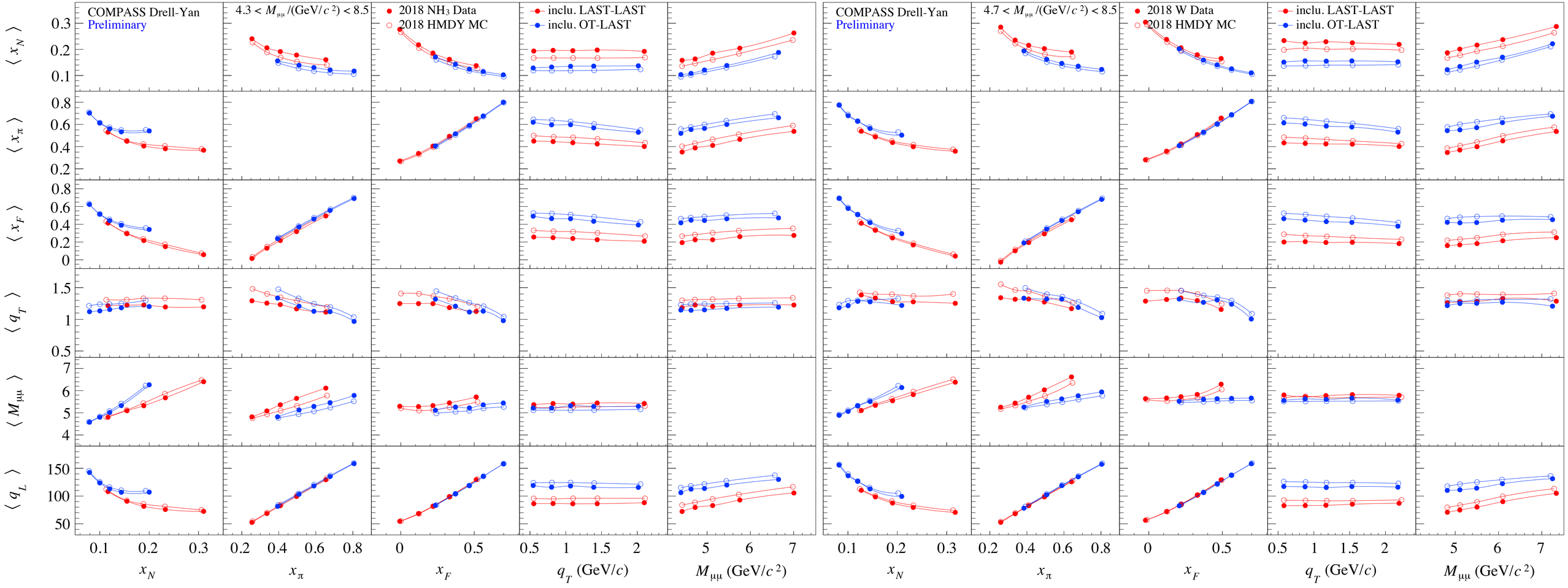
Two MC samples for this test:

- **MC1: Original MC in P02t8 configuration, in Pythia8 consider qqbar —> gamma***
- **MC2: Test MC in P02t8 configuration, in Pythia8 consider qG—> gamma* q**

P02 Only

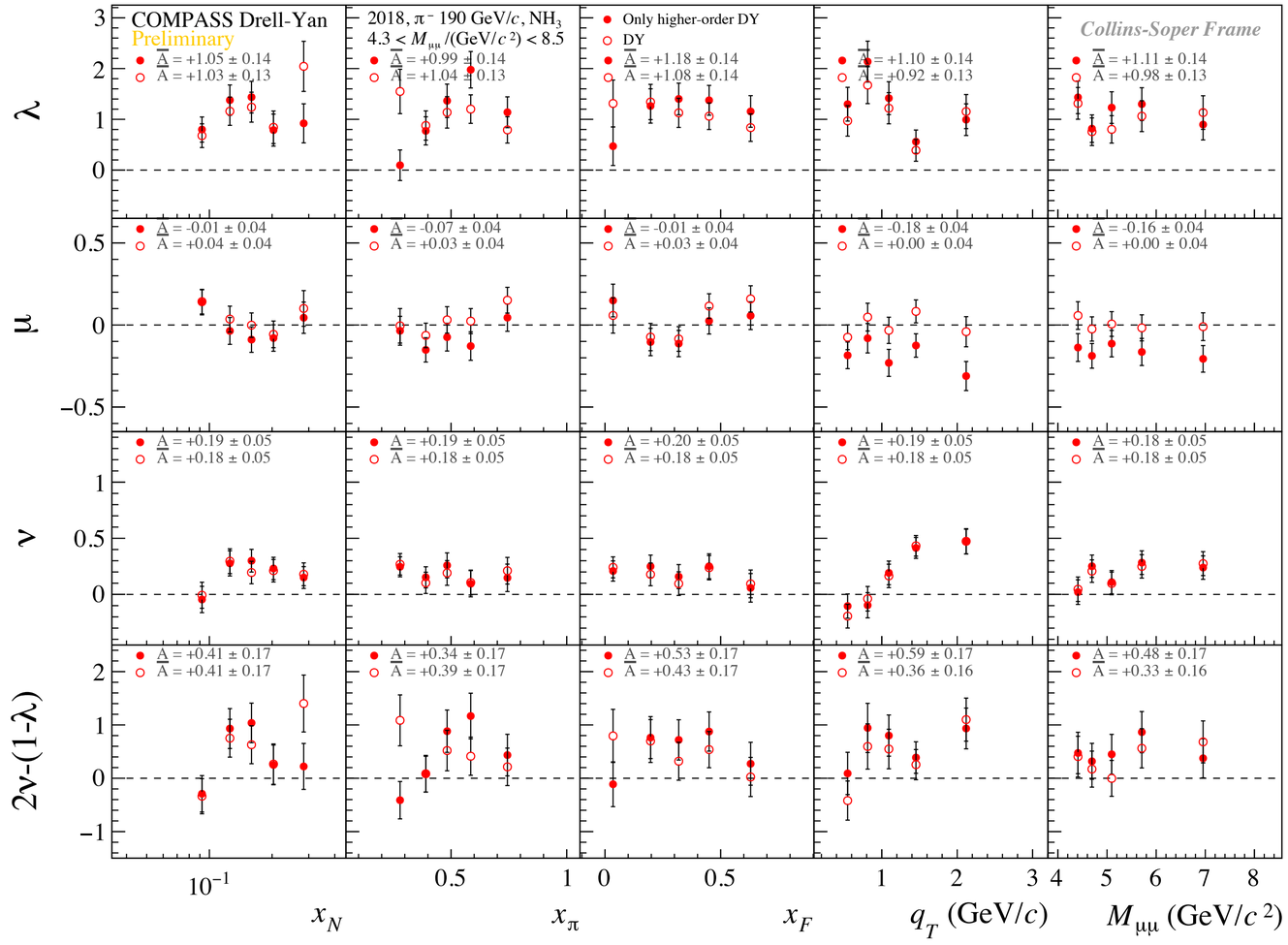
NH3

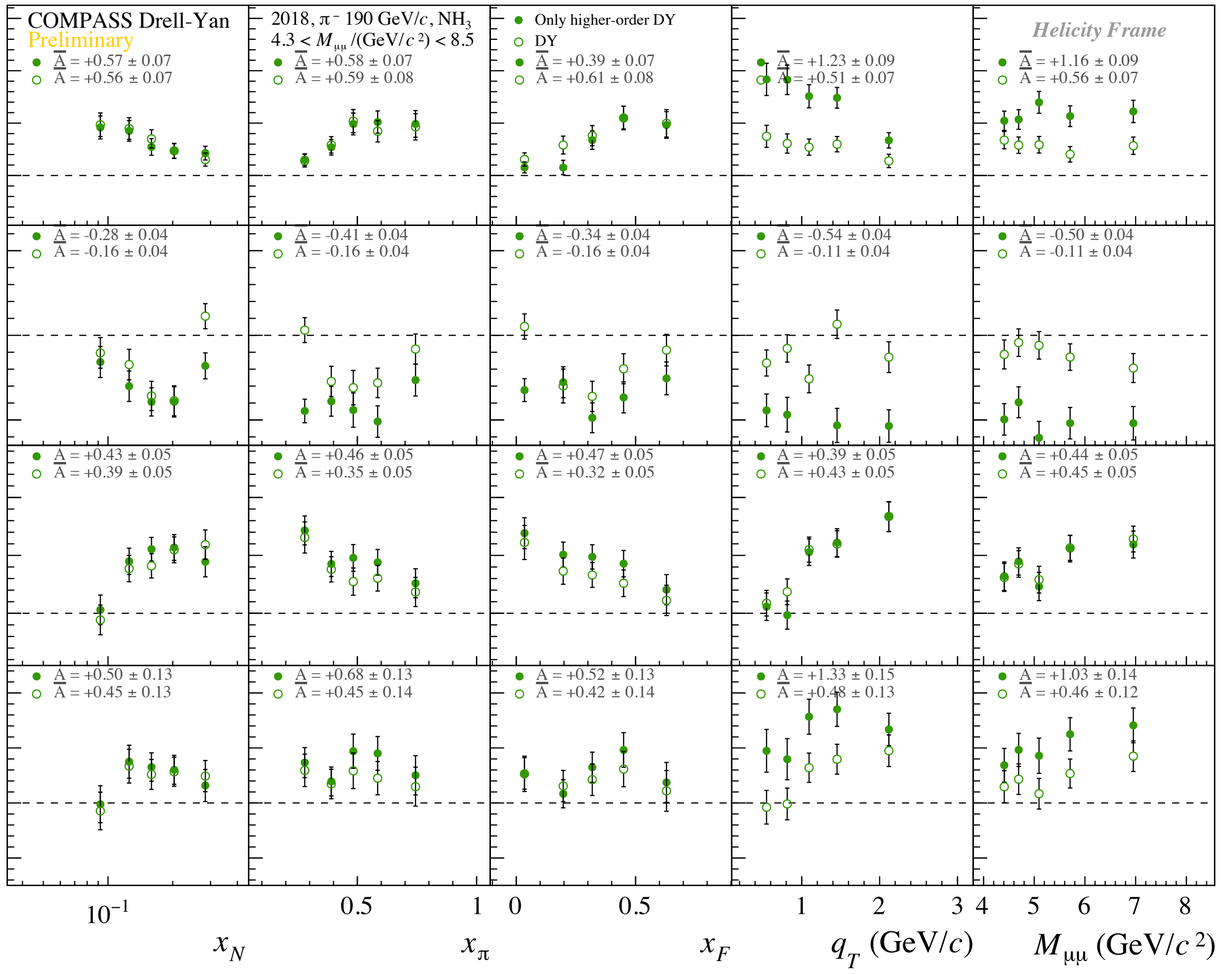
W

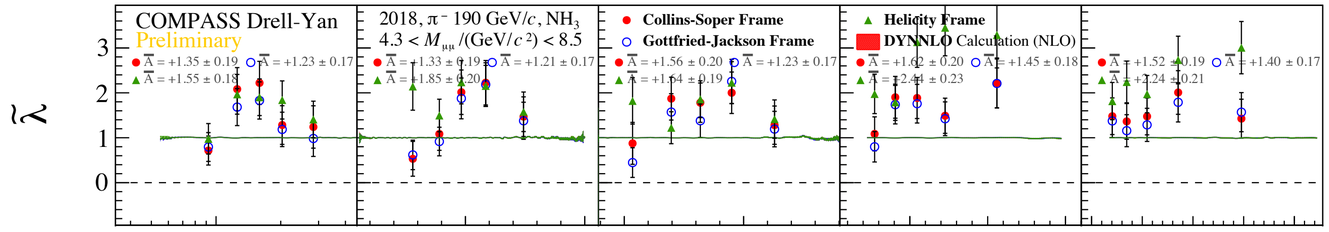


NH3

P02 Only





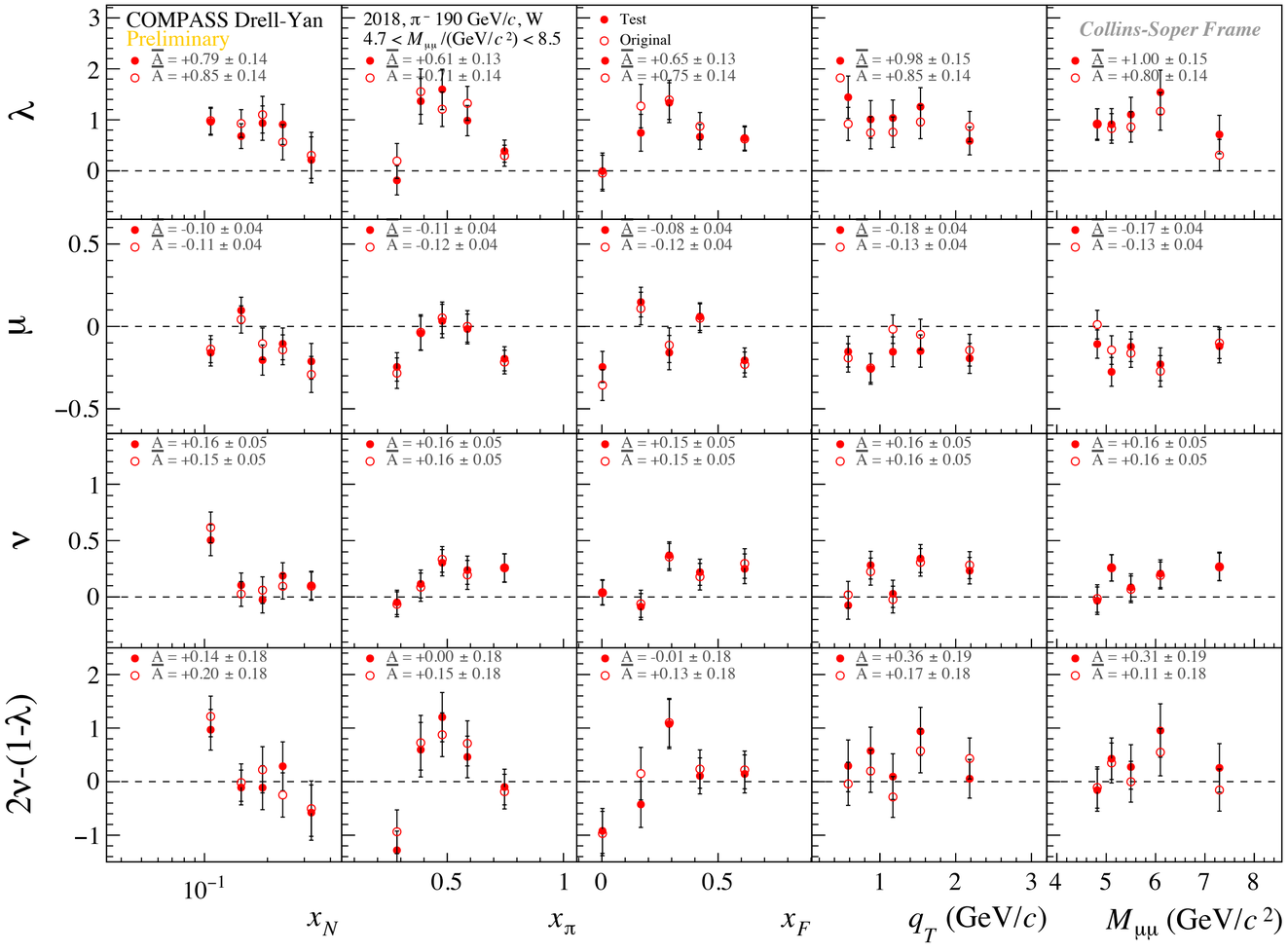


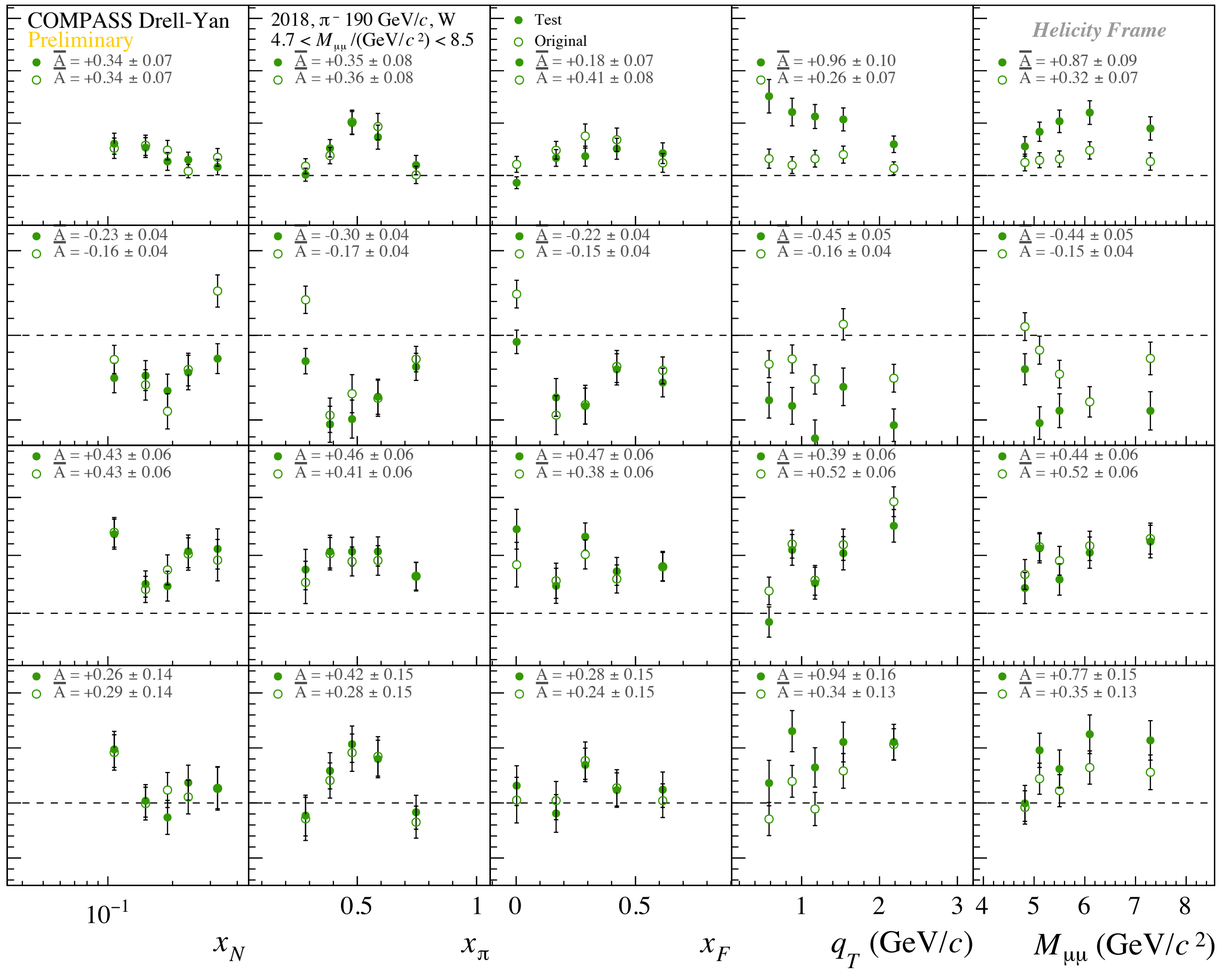
DY : qqbar —> gamma*

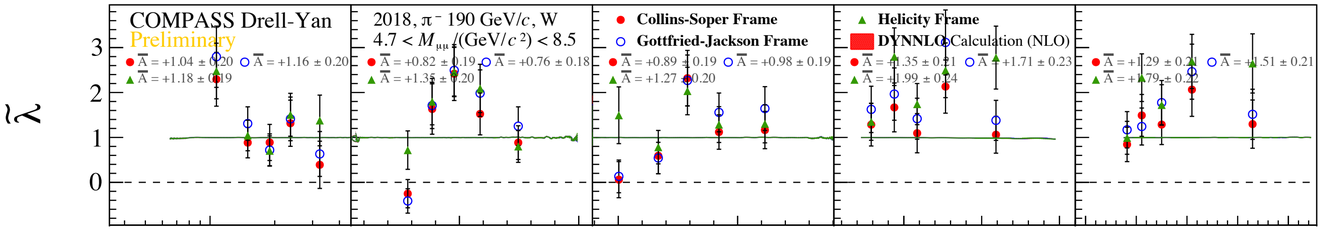
Only higher-order DY : qG—> gamma* q

W

P02 Only







DY : qqbar —> gamma*

Only higher-order DY : qG—> gamma* q

Including P07t8 data

We try to compare the difference between using 5 periods and 6 periods(+P07)

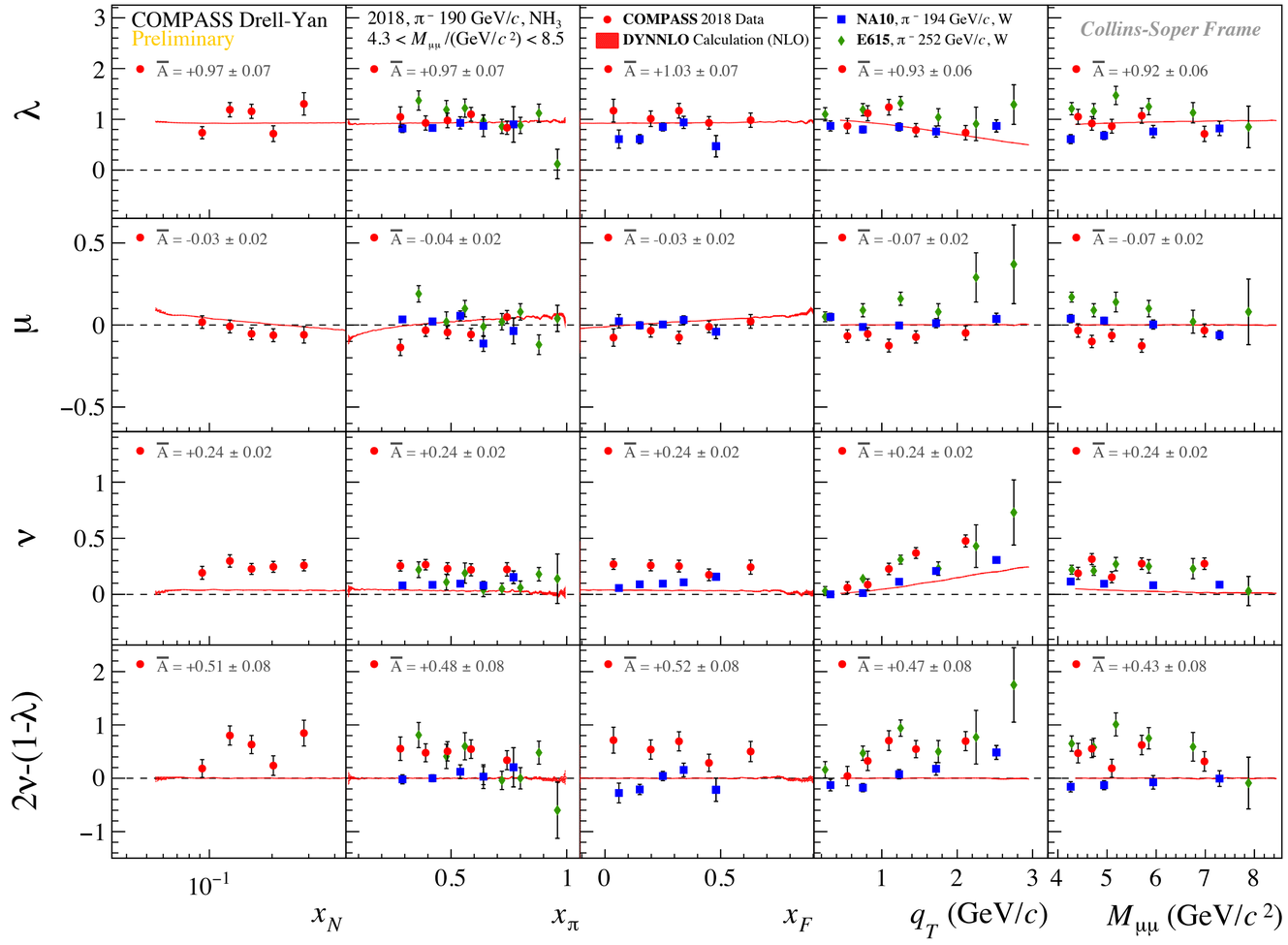
Some big change in certain kinematics bins is observed

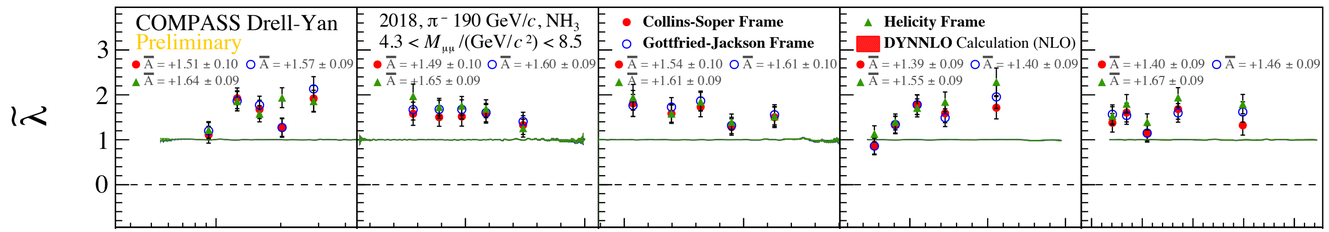
The source of this issue is identify but need more time to solve…

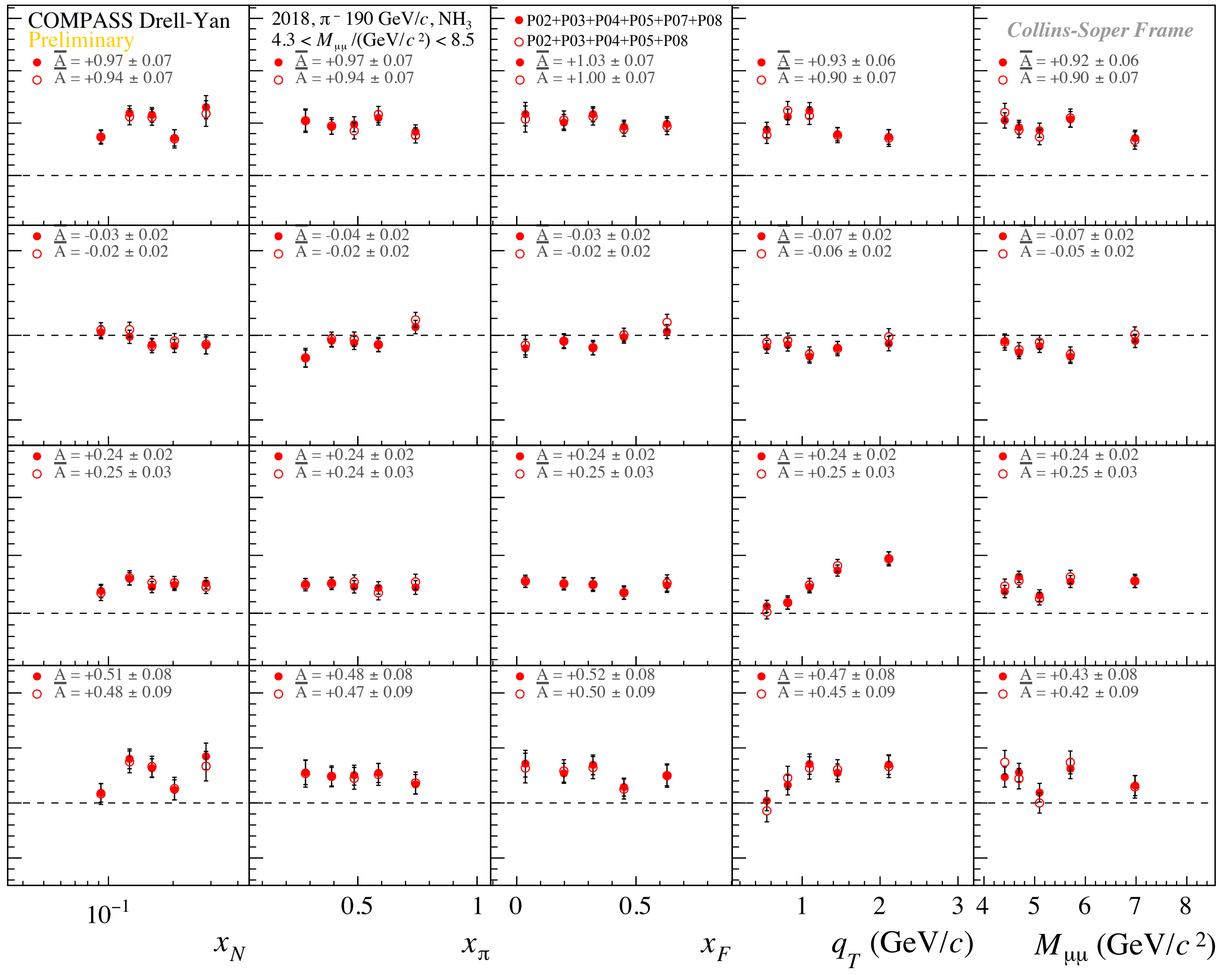
Some systematic study need to be repeated after solving this issue.

NH3

Using MC samples: v1r2

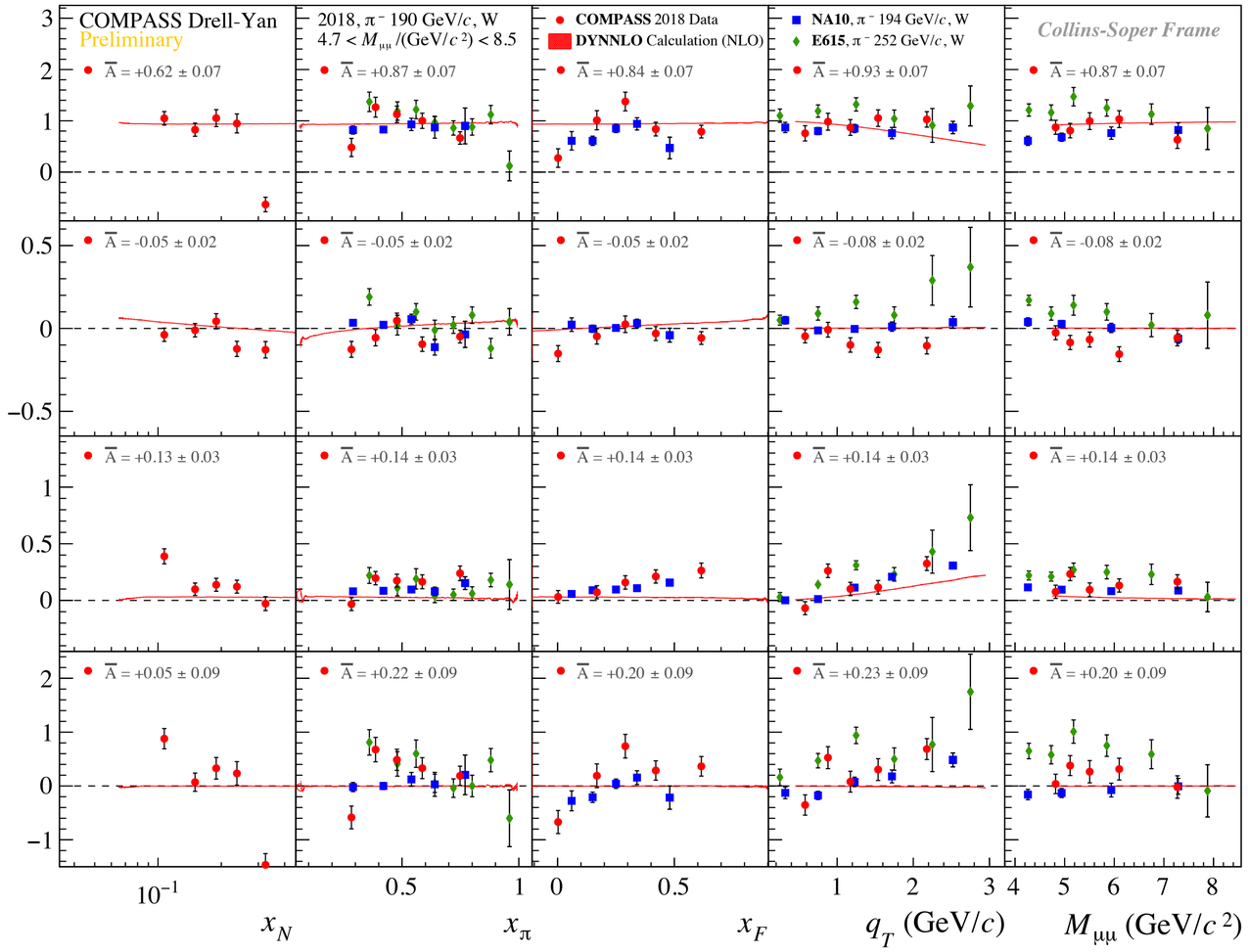


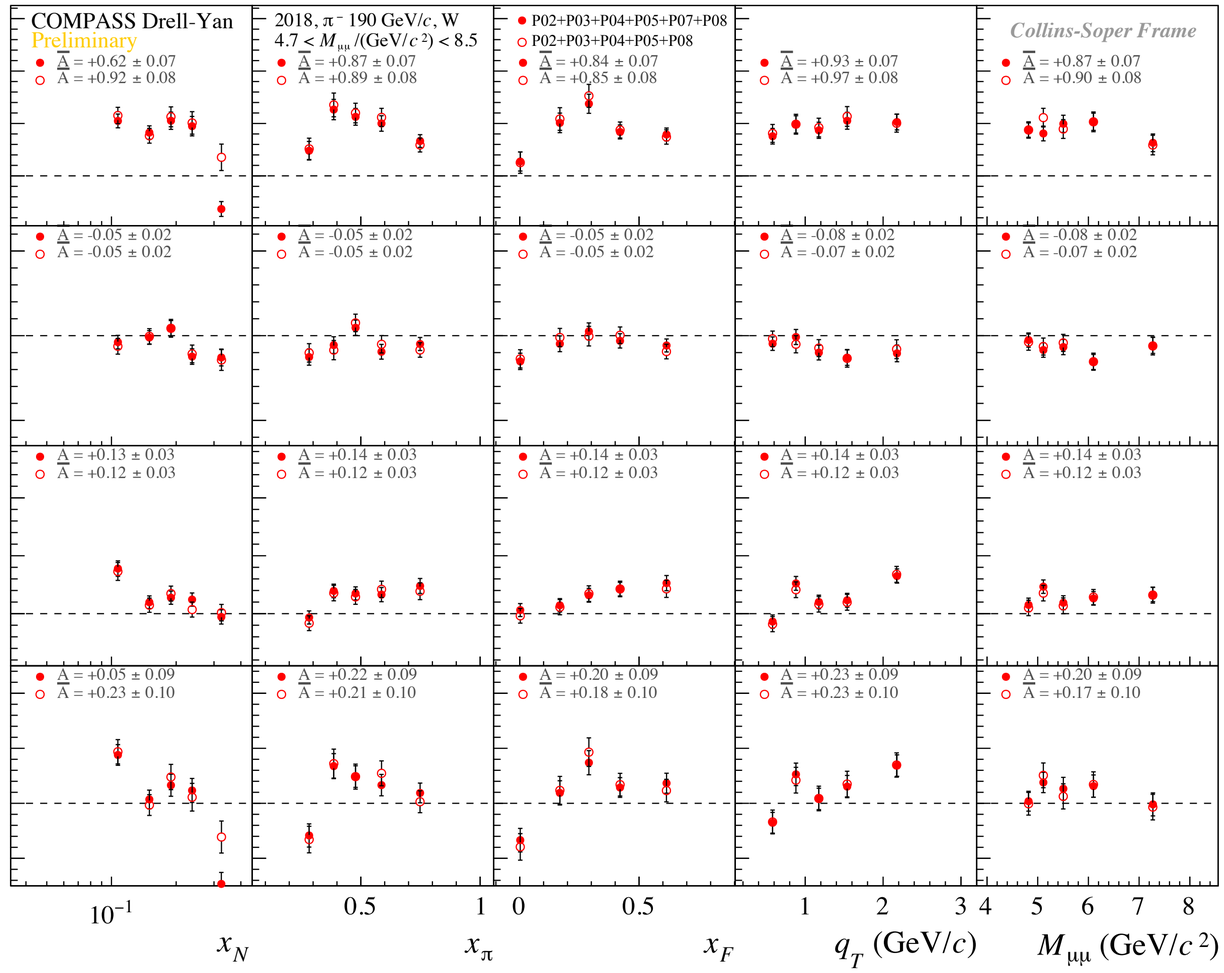


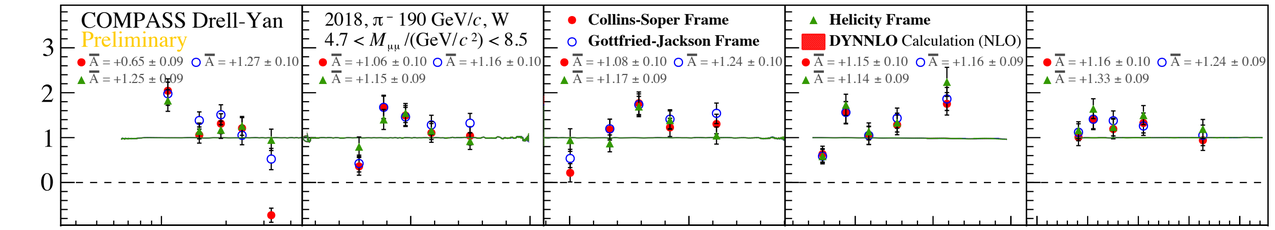


W

Using MC samples: v1r2







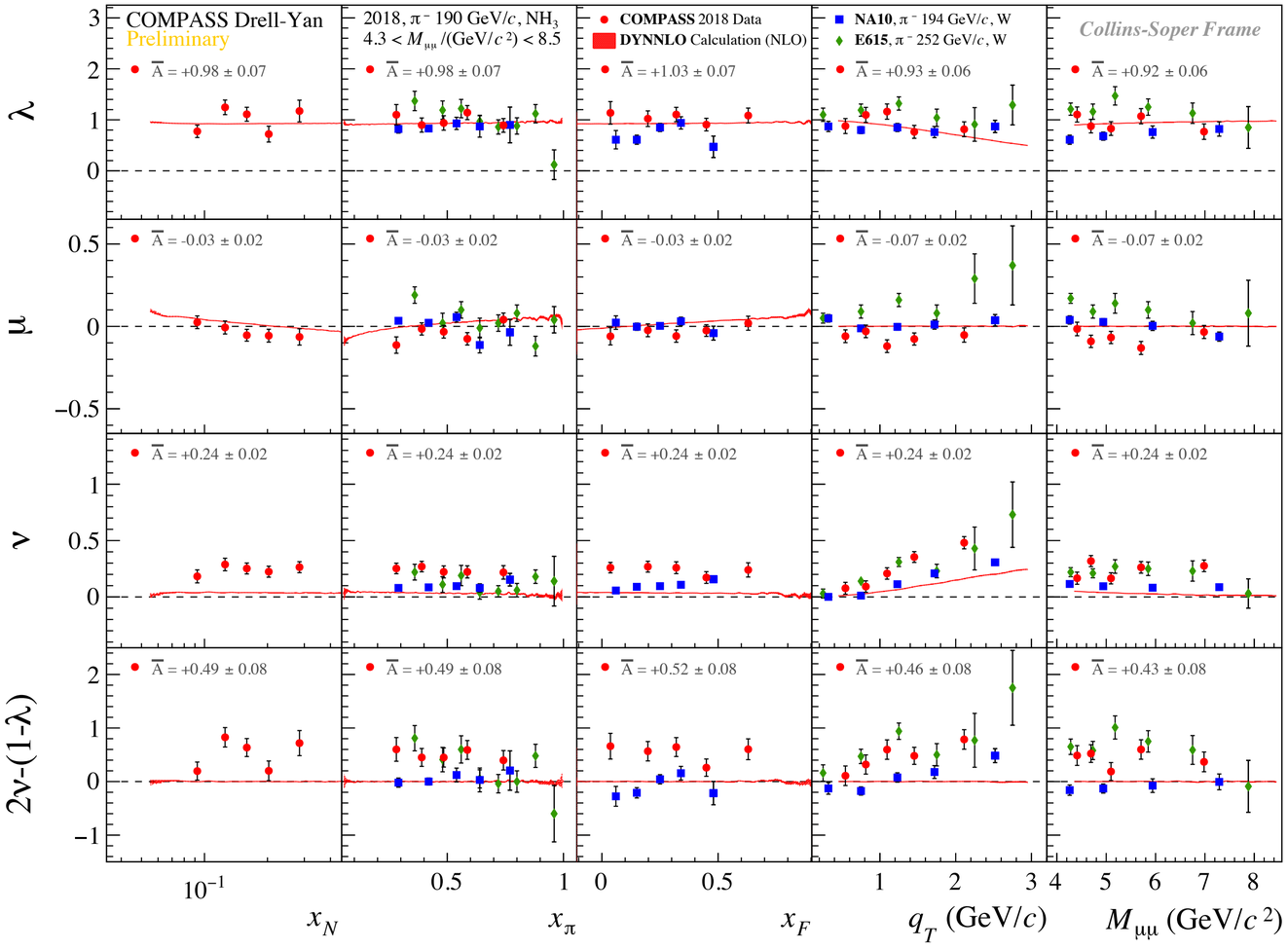
Some significant change at the last bin of x_N after including P07 data…

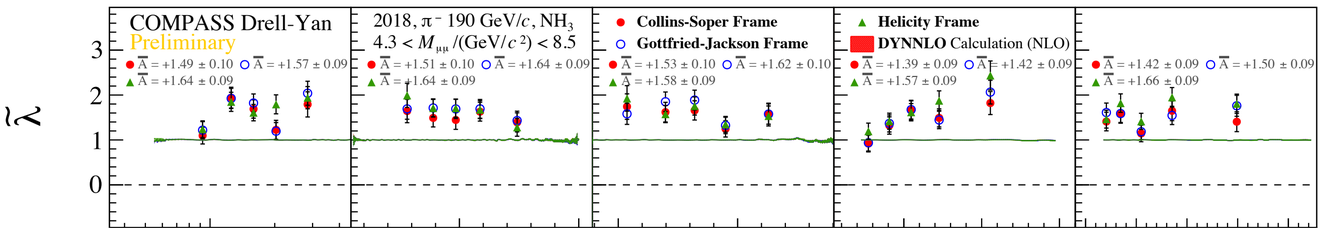
Invariant lambda result indicate a big systematic uncertainty in this bin.

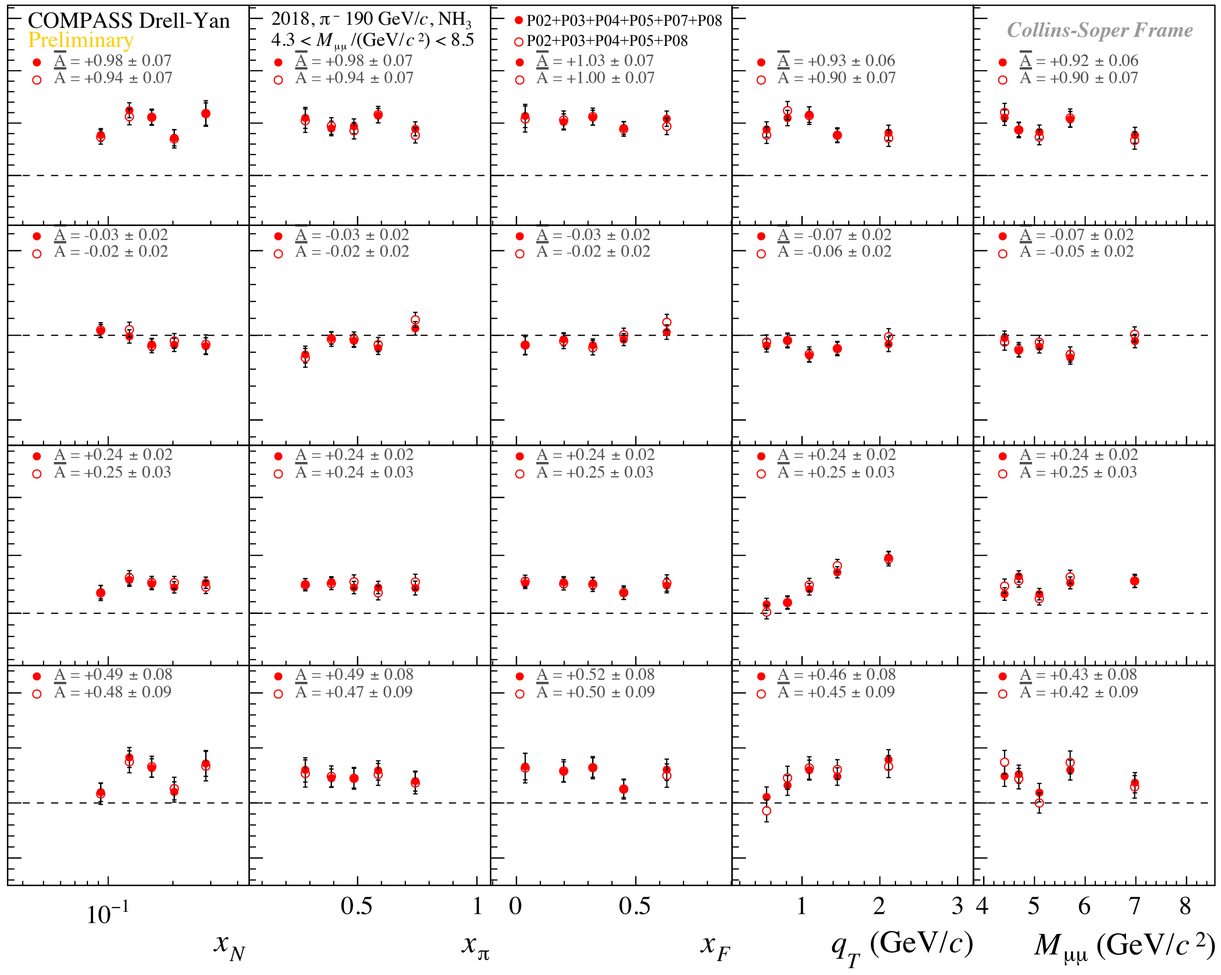
After some investigation, the problem might come from the lack of statistics in MC sample…

NH_3

Using MC samples: v1r1

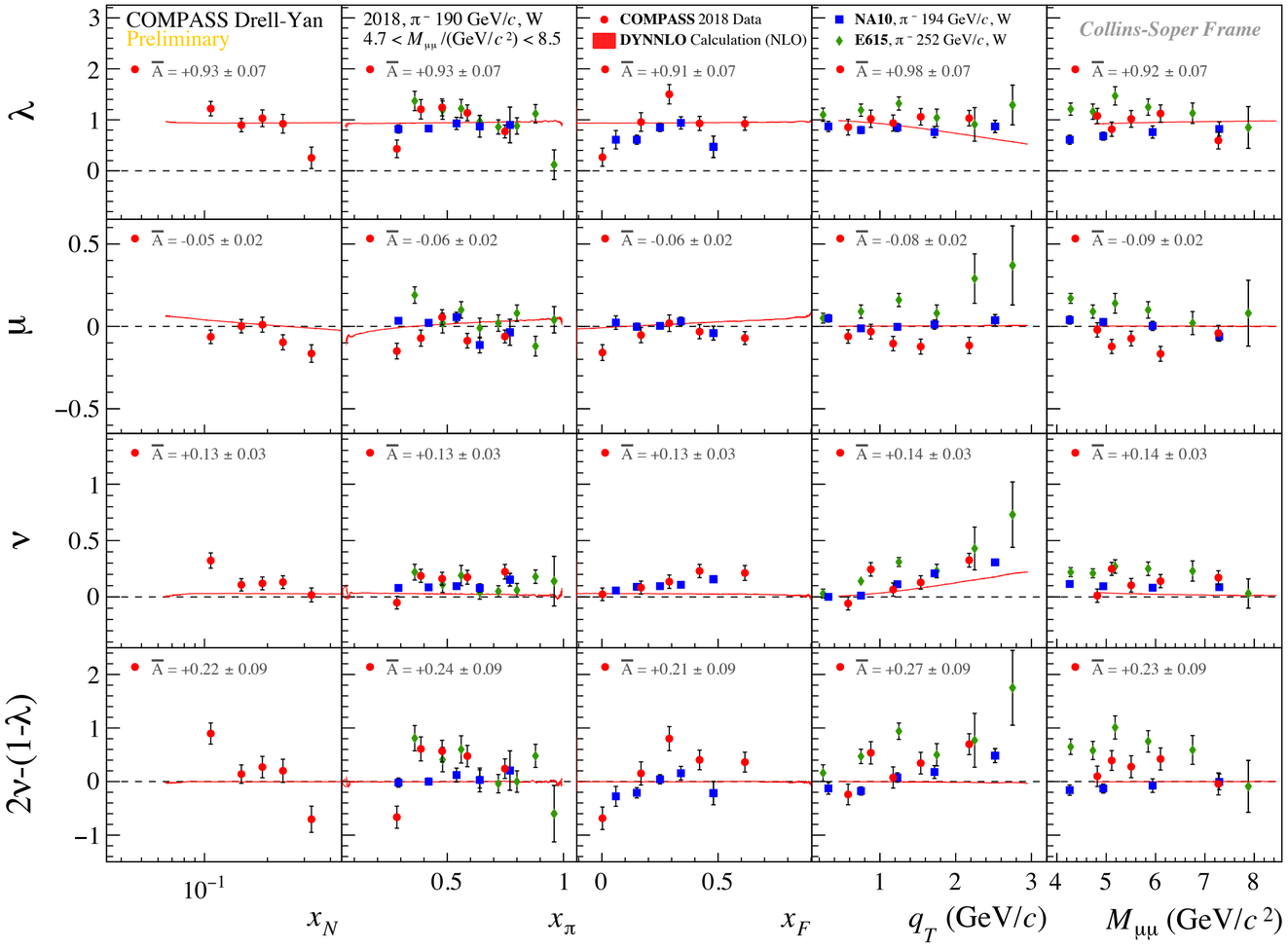


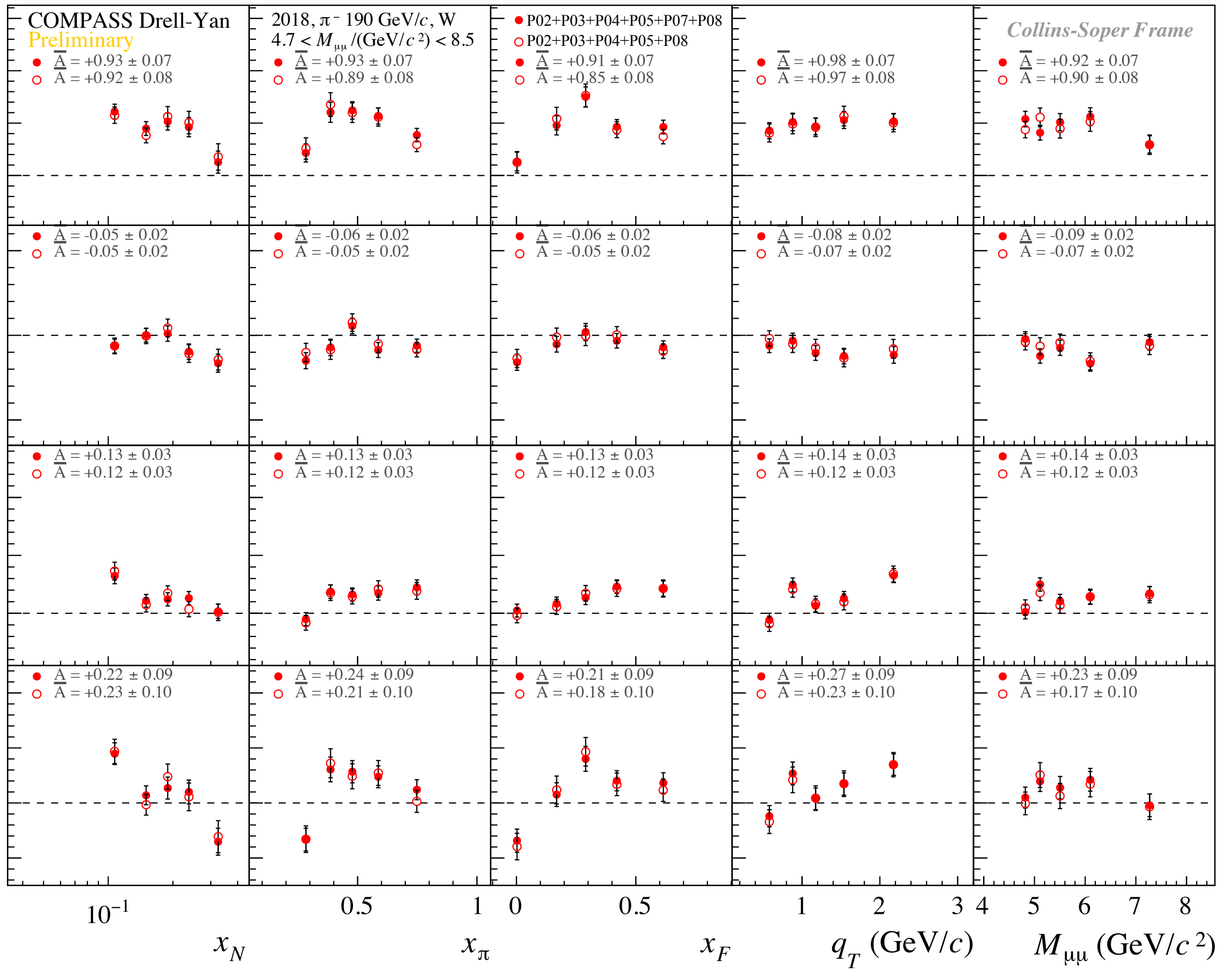


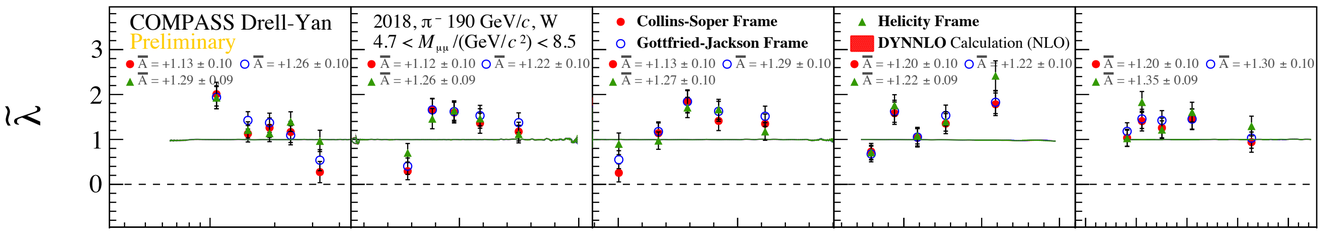


W

Using MC samples: v1r1

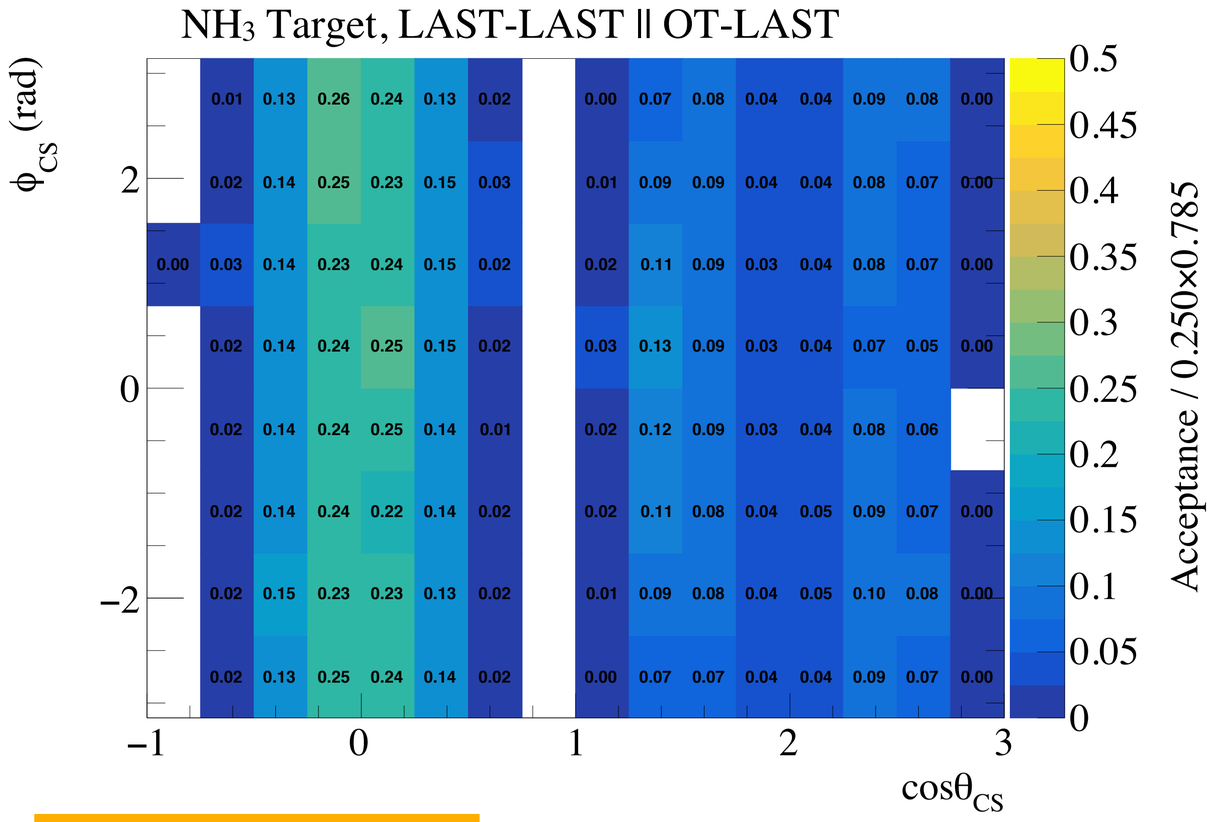




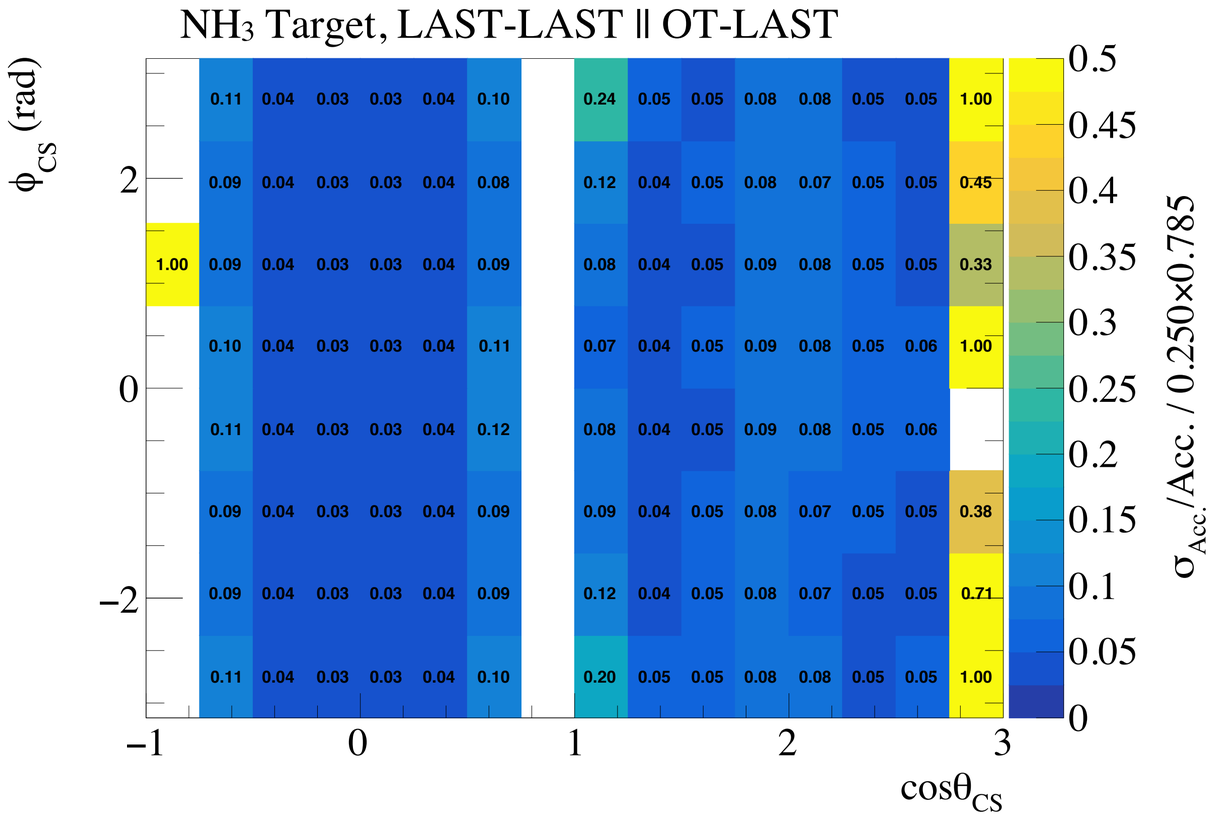


NH3

Angular Acceptance



σAcc. /Acceptance



MC samples: P07v1r2

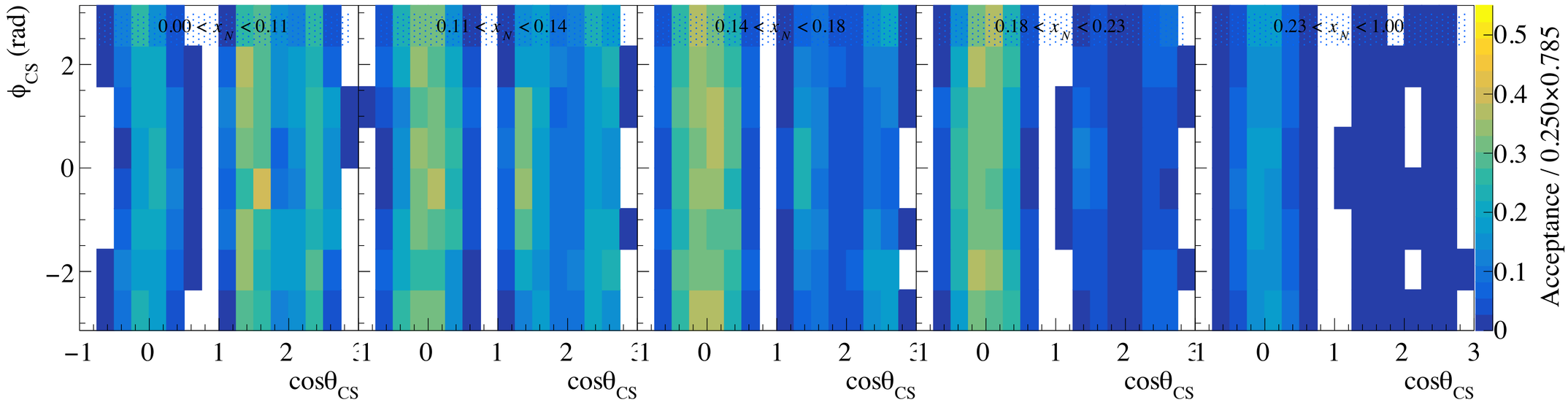
Try to apply the cuts during fitting:

1. Minimum acceptance: **skip if acceptance < 1%**
2. Maximum acceptance uncertainties: **skip if σAcc. /Acceptance > 40%**

NH3

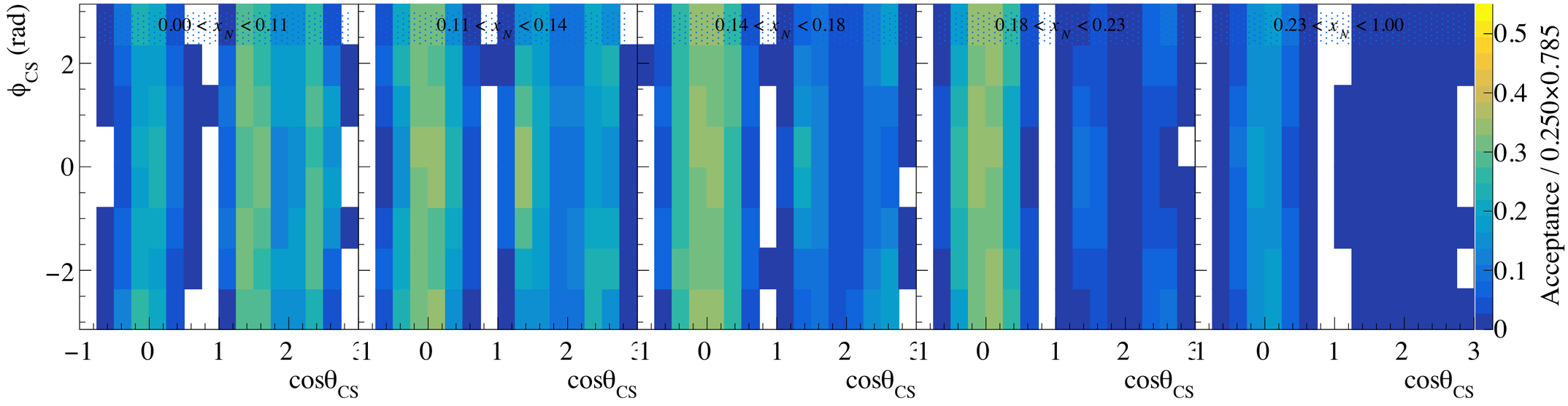
Angular Acceptance

MC samples: P07v1r2



MC samples: P07v1r1

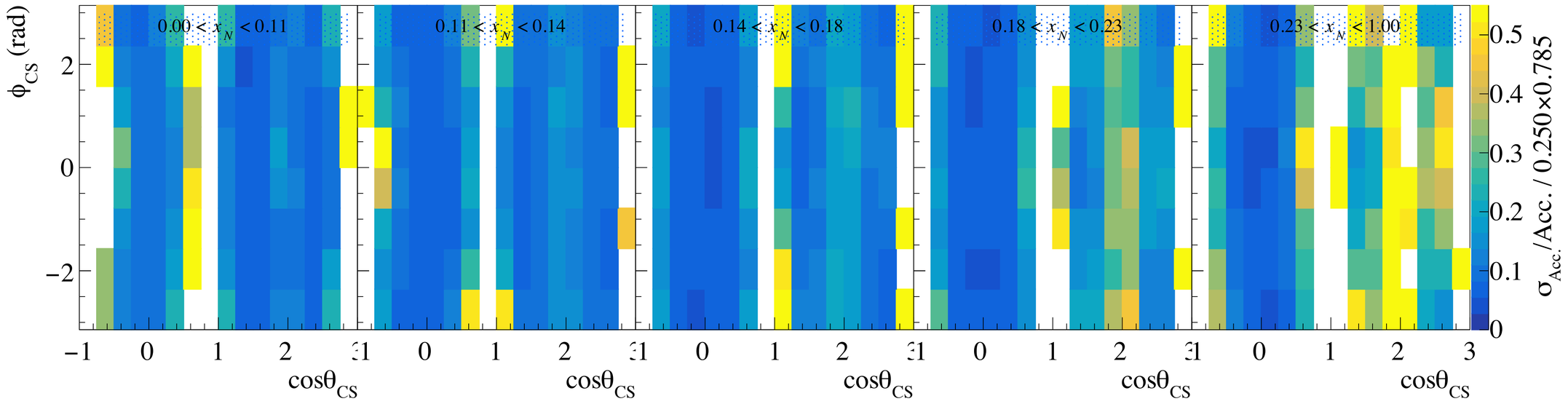
5 times more statistics w.r.t v1r2



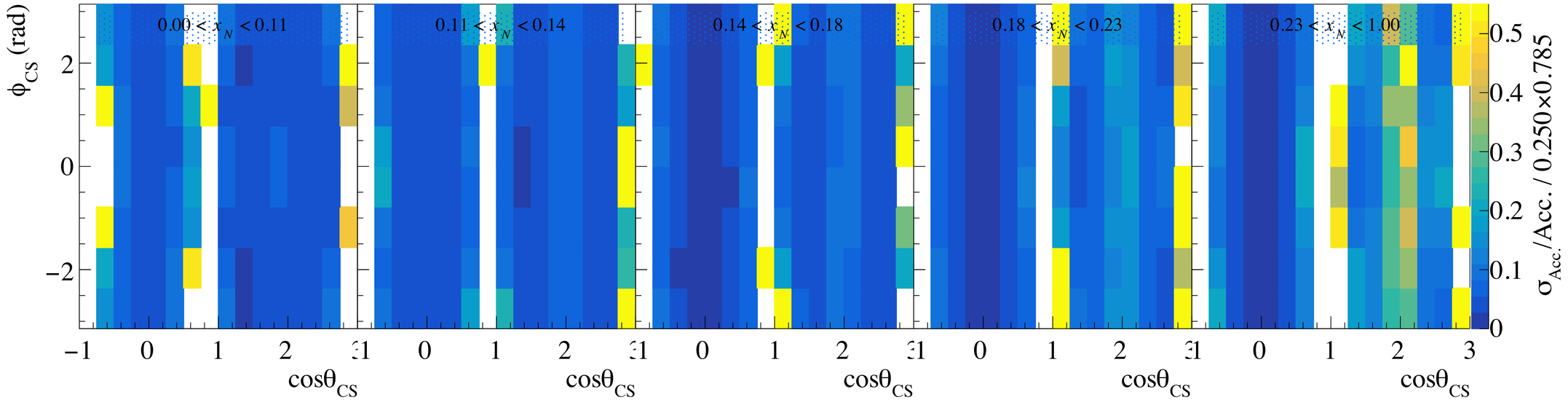
NH3

σAcc. /Acceptance

MC samples: P07v1r2

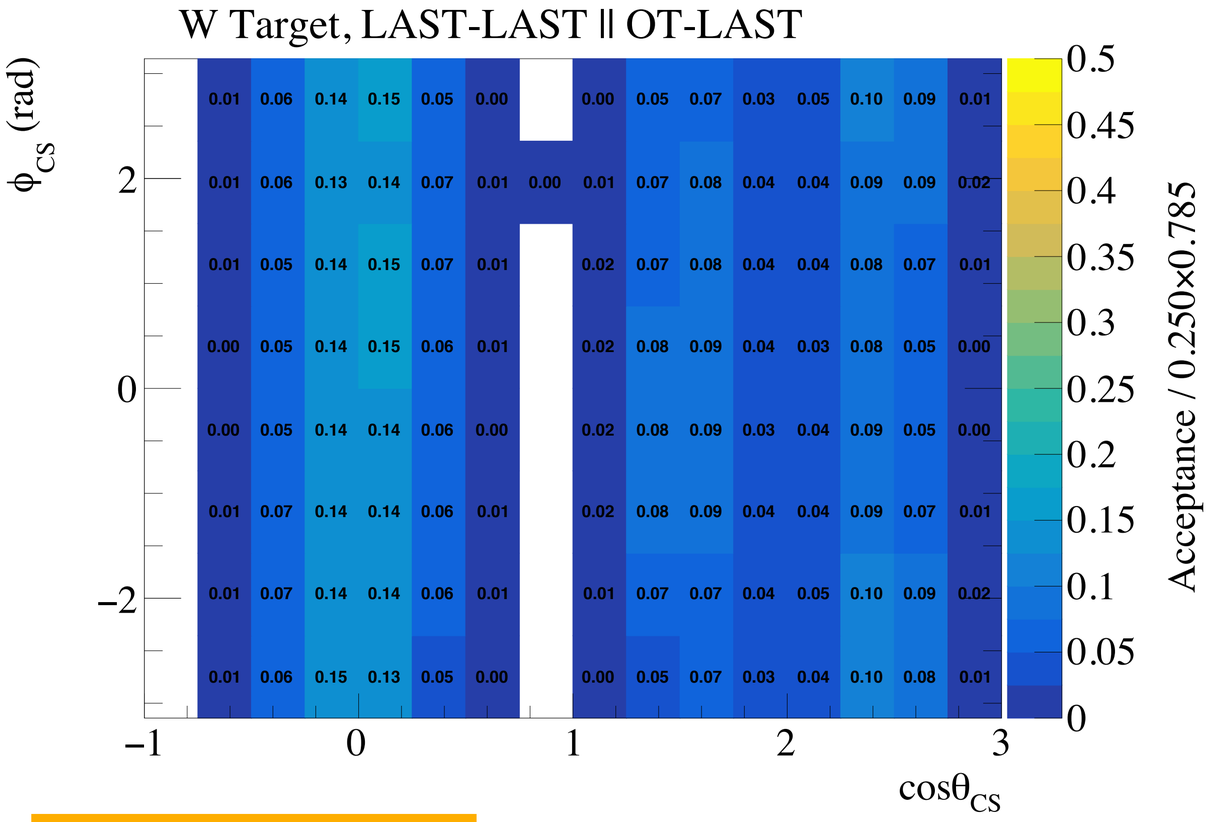


MC samples: P07v1r1 5 times more statistics w.r.t v1r2

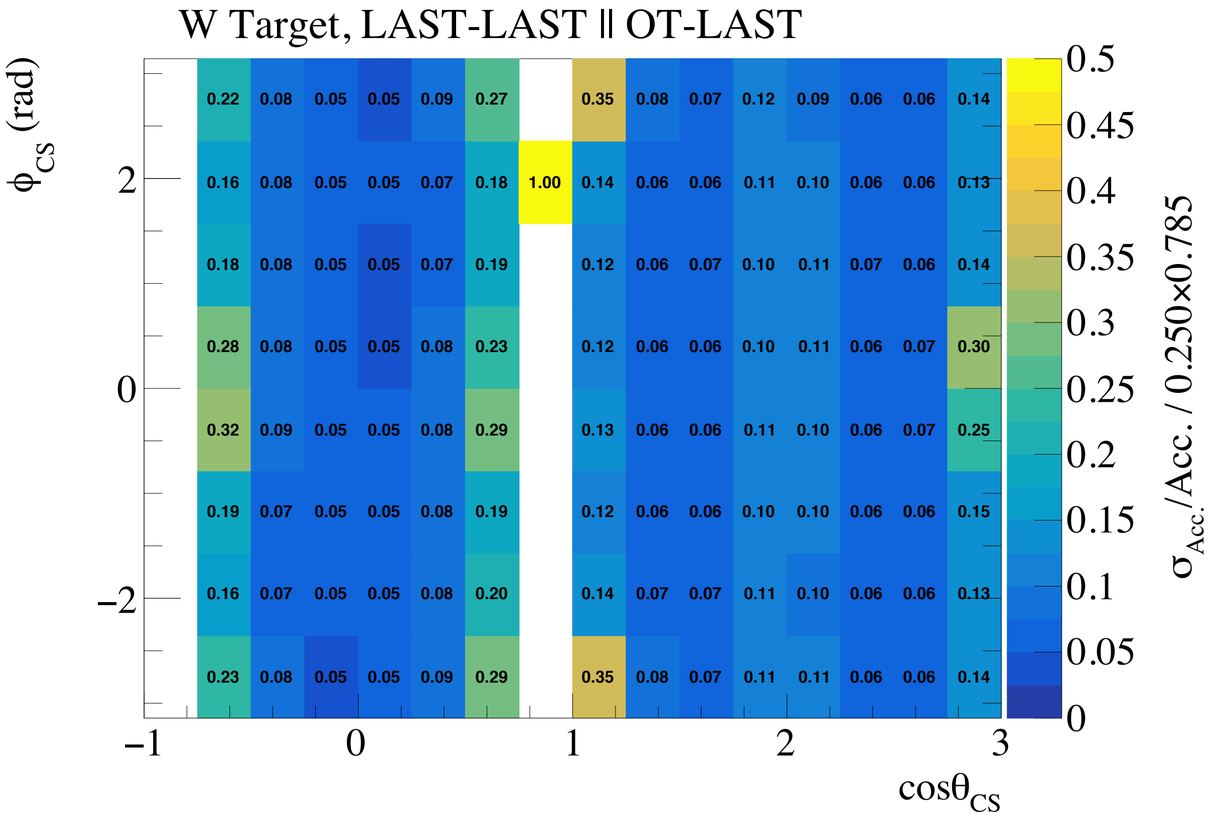


W

Angular Acceptance



$\sigma_{Acc.}$ /Acceptance



MC samples: P07v1r2

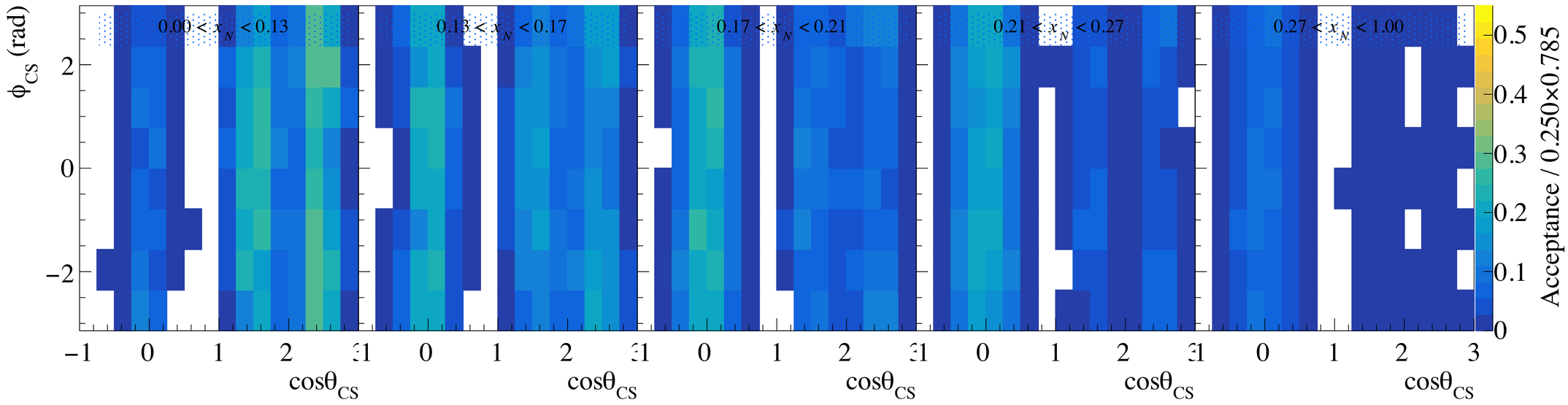
Try to apply the cuts during fitting:

1. Minimum acceptance: **skip if acceptance < 1%**
2. Maximum acceptance uncertainties: **skip if $\sigma_{Acc.}$ /Acceptance > 40%**

W

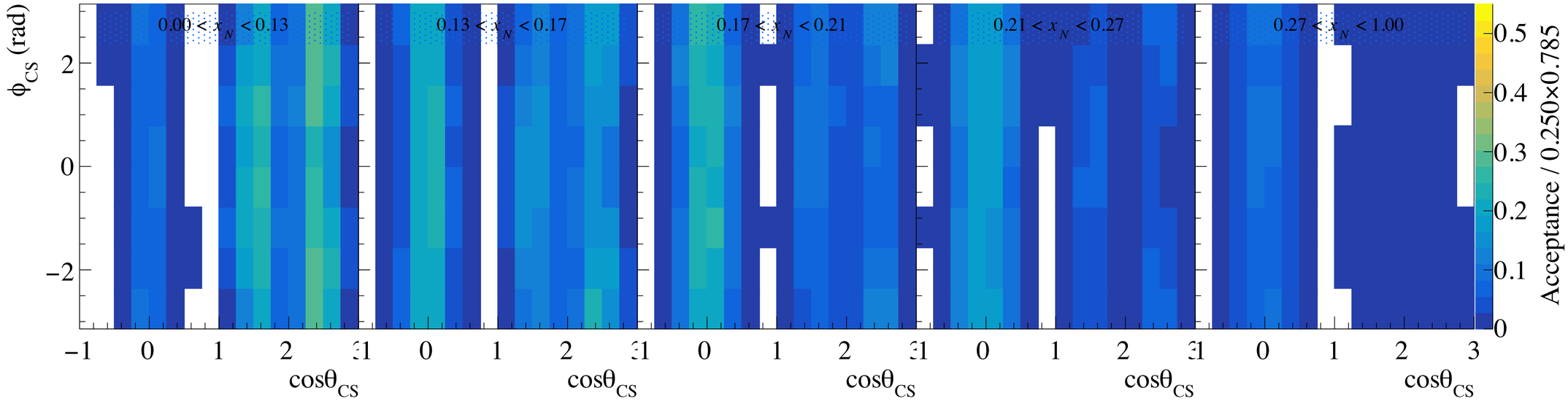
Angular Acceptance

MC samples: P07v1r2



MC samples: P07v1r1

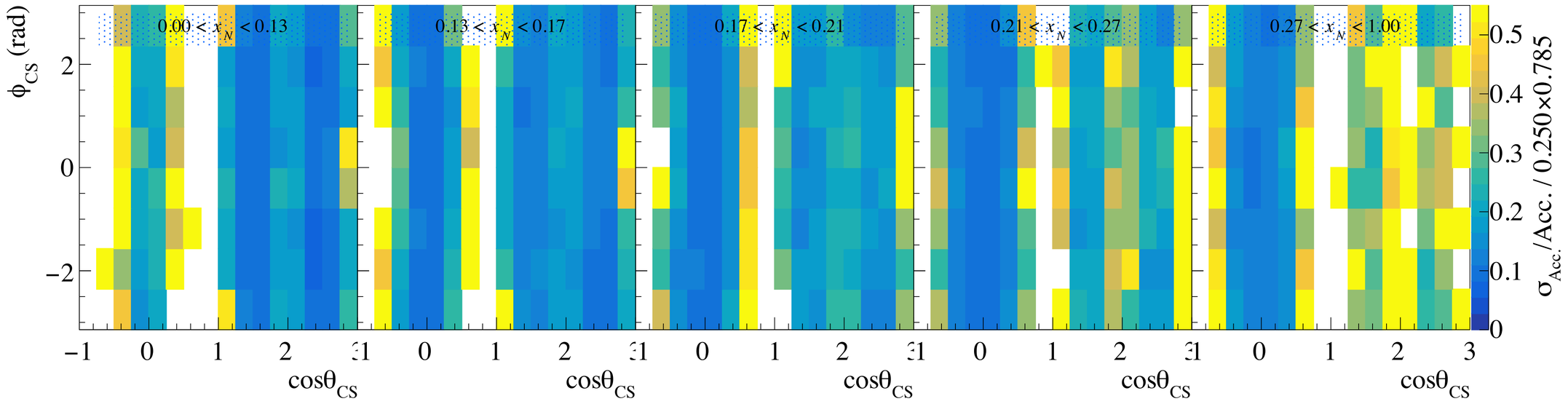
5 times more statistics w.r.t v1r2



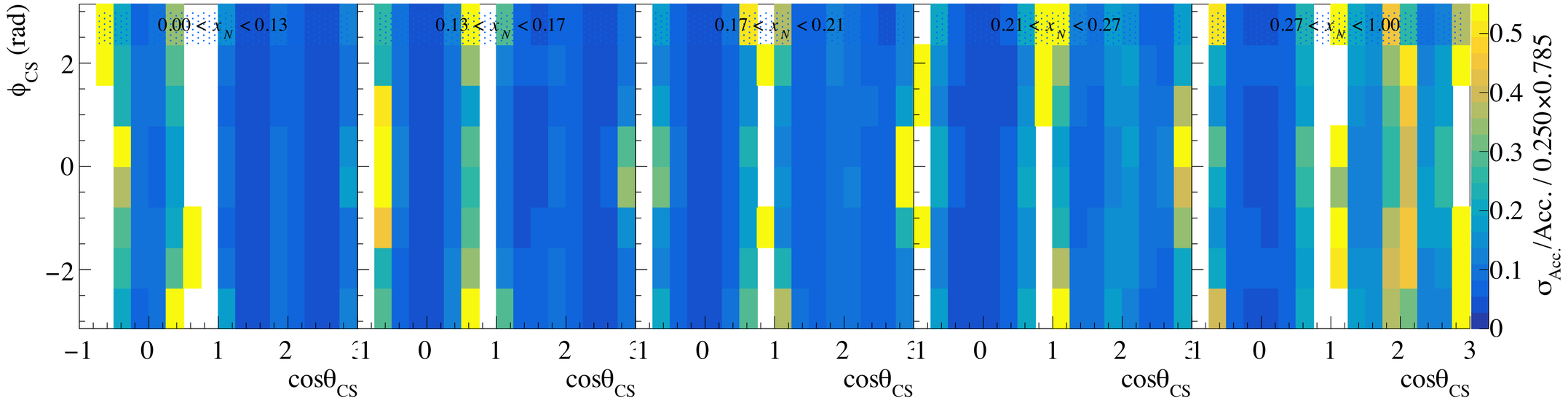
W

σAcc. /Acceptance

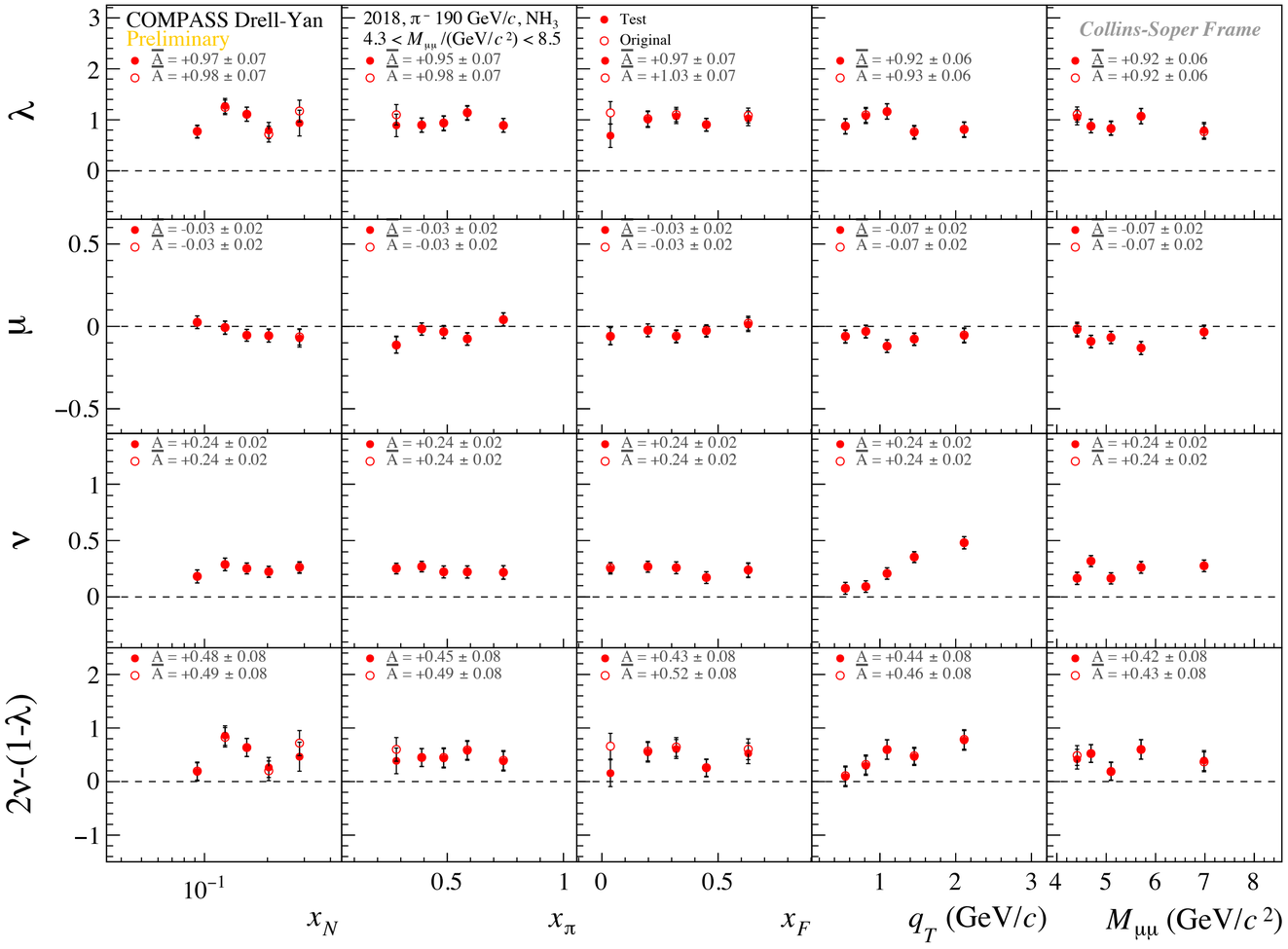
MC samples: P07v1r2

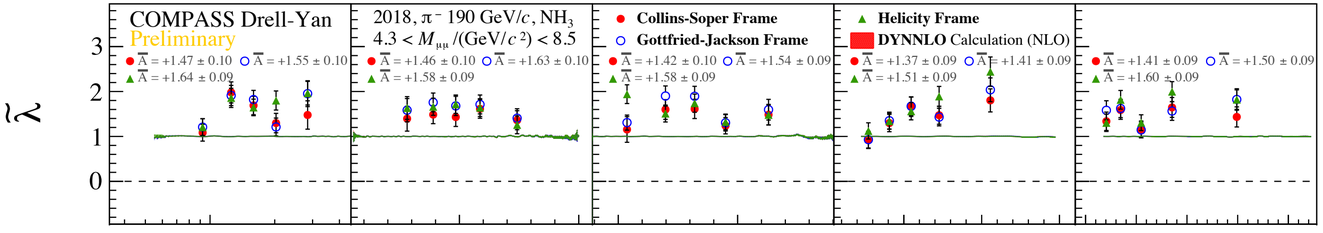


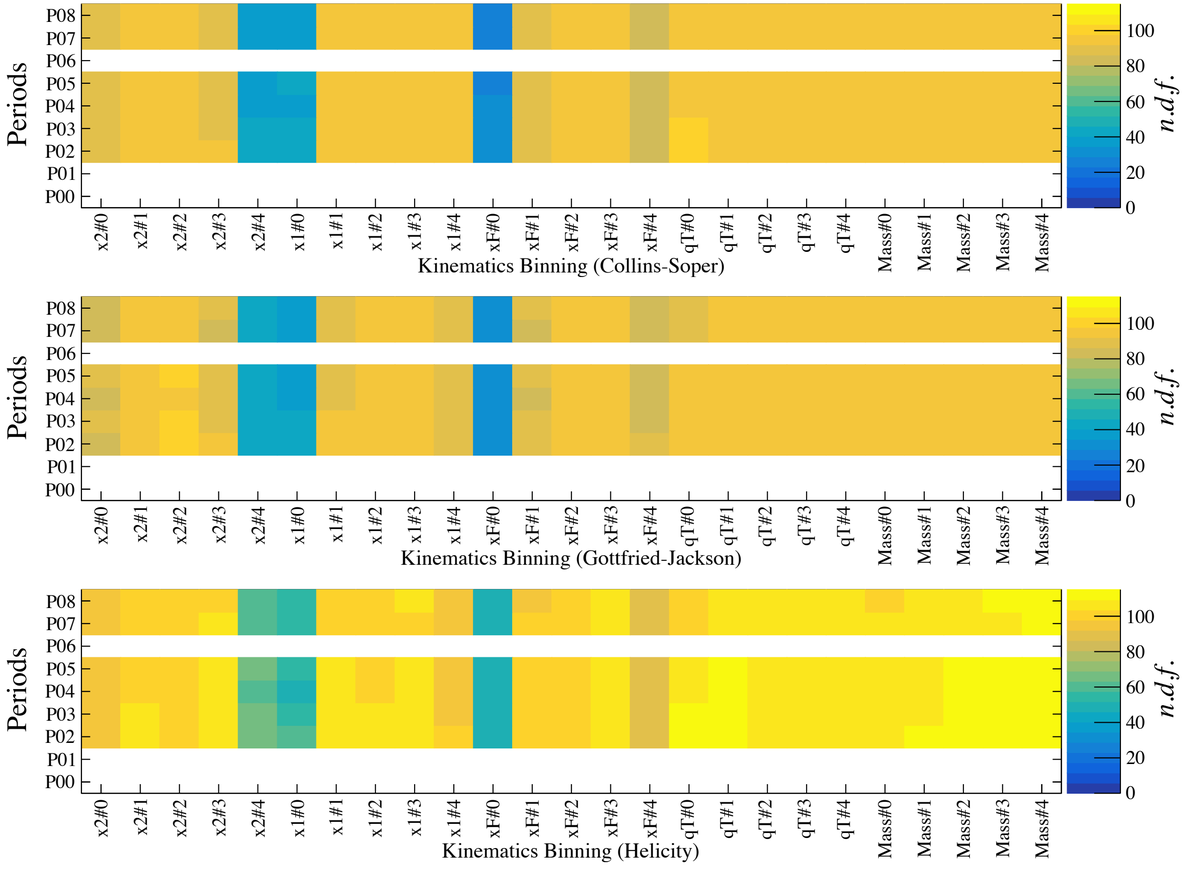
MC samples: P07v1r1 5 times more statistics w.r.t v1r2



NH_3





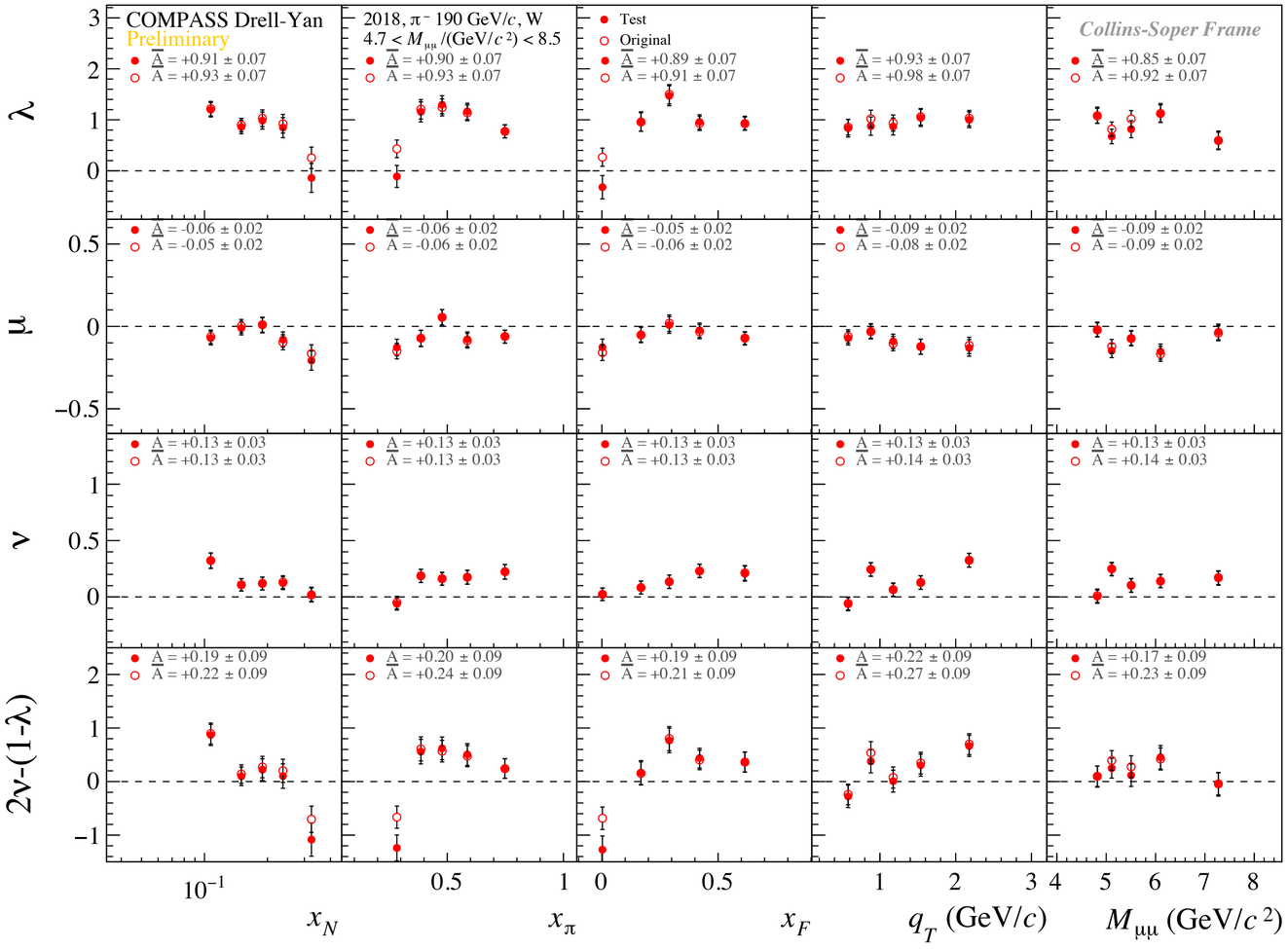


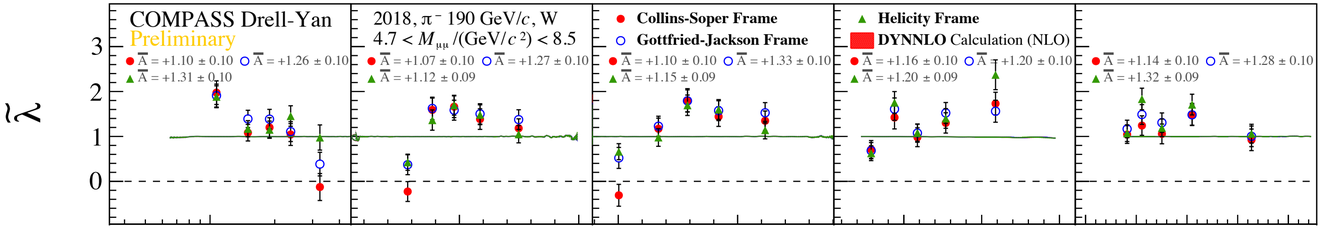
Try to apply the cuts during fitting:

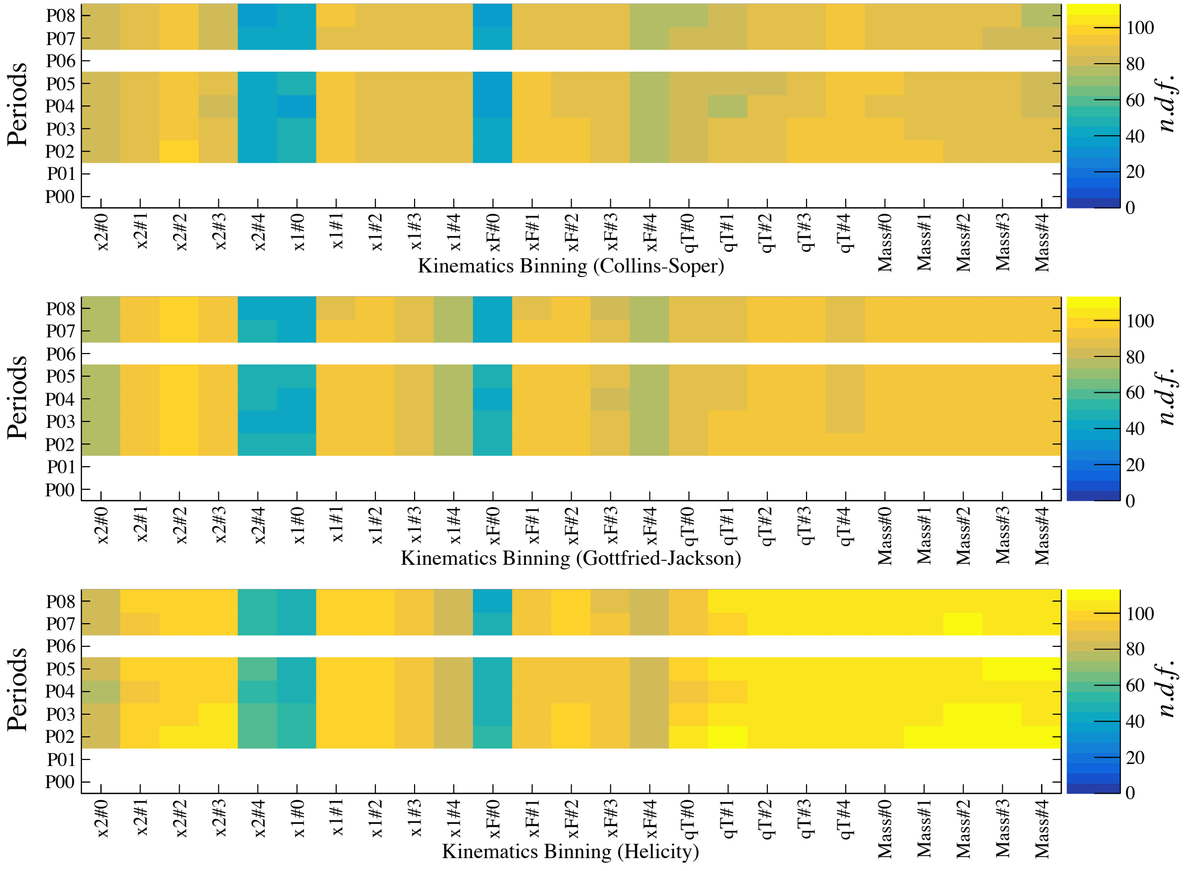
1. Minimum acceptance: **skip if acceptance < 1%**
2. Maximum acceptance uncertainties: **skip if $\sigma_{Acc.}$ /Acceptance > 40%**

Current MC statistics is still not enough for small xF region, need to increase MC statistics…

W







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