H3L/Lambda vs dN/deta

Dongsheng Li

Outline

- H3L spectra
  - Analysis Cuts
  - Raw Yield
  - Corrected Spectra
  - Systematics
- H3L/Lambda vs dN/deta
  - H3L and Lambda dNdy
  - H3L/Lambda

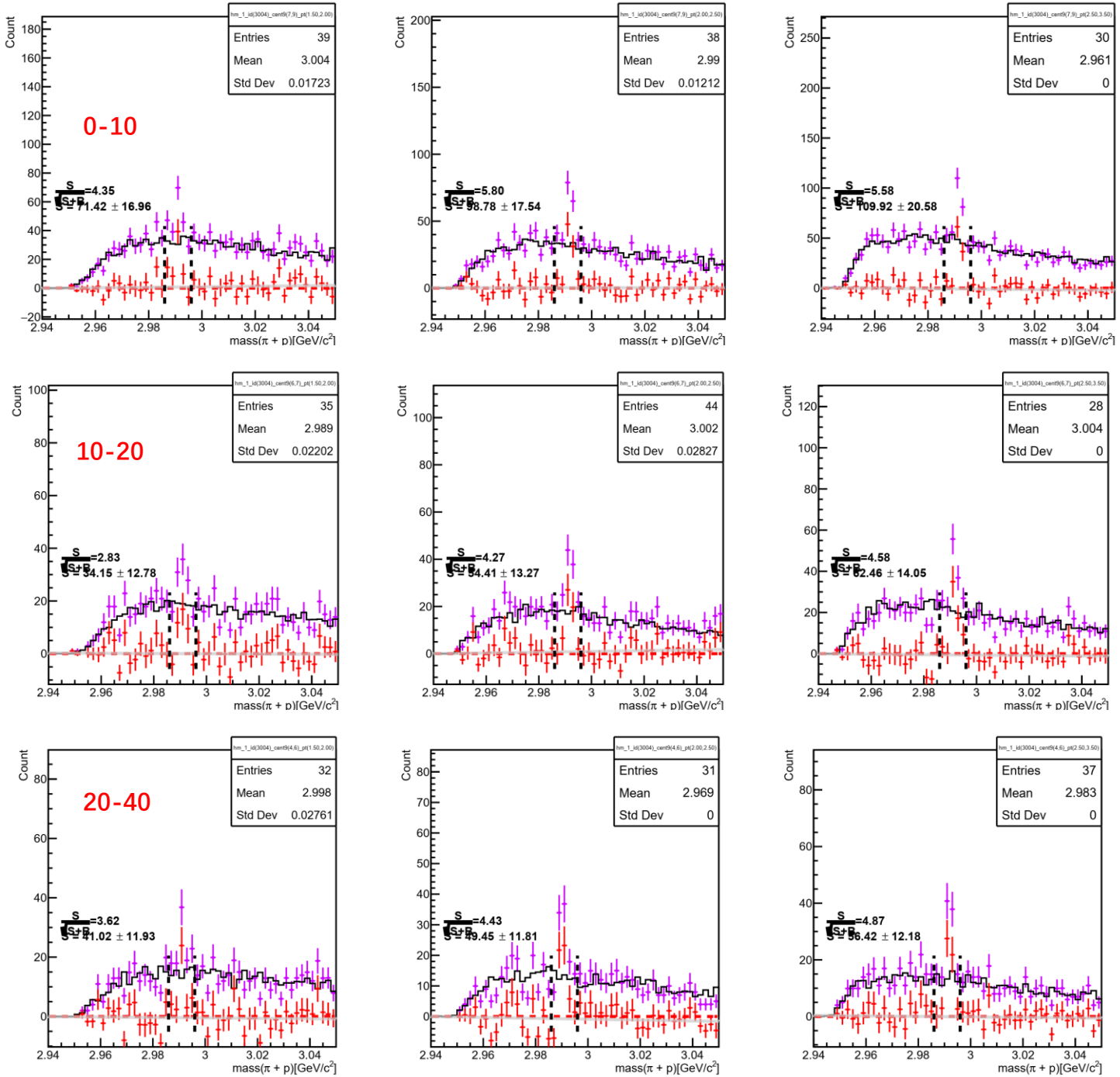
Analysis Cuts

- **Tuned by hand**
- **pT binning: [1.5,2.0], [2.0,2.5], [2.5,3.5]**

Ana cuts for 0-40%	Default	Var1	Var2
Chi2topo	<=4.5	<=4	<=5
Chi2ndf	<=4	**<=4**	**<=6**
Chi2primary_pi	>=8	>=10	>=5
Ldl	>=5.	>=5.5	>=4.5
L	>=5.5	>=6	>=5
p_he	>=1, from PID		
Dca_he(at pT<2)	<=1.5	**<=0.8**	**<=1.5**

Signal extraction			
Mass window	4sigma	3sigma	5sigma

Tracking			
NHits	>=17	>=15	>=20



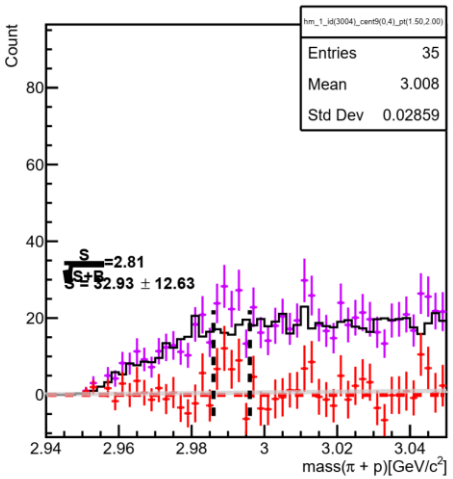
Analysis Cuts

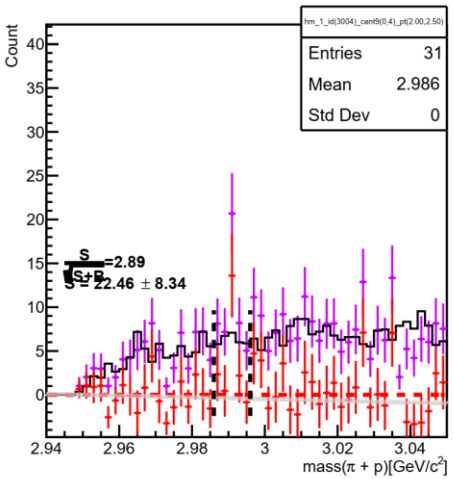
- **Tuned by hand**
- **pT binning: [1.5,2.0], [2.0,2.5], [2.5,3.5]**

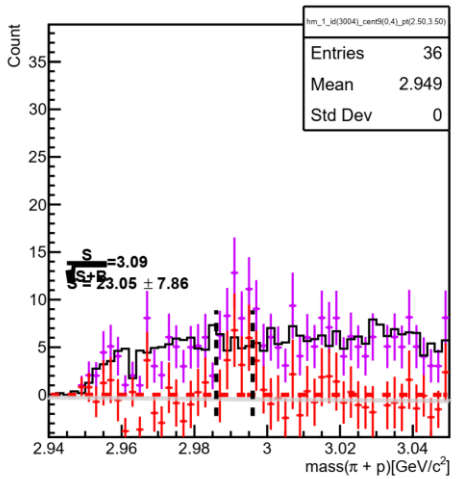
Ana cuts for 40-80%	Default	Var1	Var2
Chi2topo	<=4.5	<=4	<=5
Chi2ndf	<=9	<=8	<=10
Chi2primary_pi (pT<2.5)	>=5	>=10	>=5
Ldl (pT<2.)	>=1.5	>=2	>=1
Ldl (pT 2.~2.5)	>=2.5	**>=3**	**>=2**
Ldl (pT 2.5~3.5)	>=2	**>=3**	**>=2**
L	>=1.5	**>=2.5**	**>=1.5**
p_he	>=1, from PID		
Dca_he (pT<2)	<=1.5	**<=0.8**	**<=1.5**

Signal extraction			
Mass window	4sigma	3sigma	5sigma

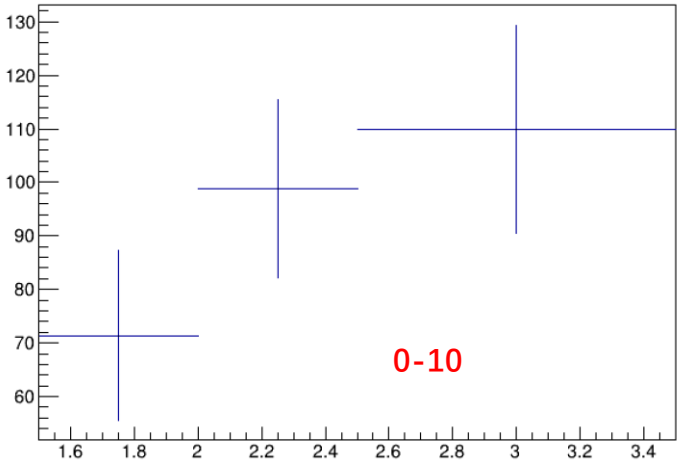
Tracking			
NHits	>=17	>=15	>=20

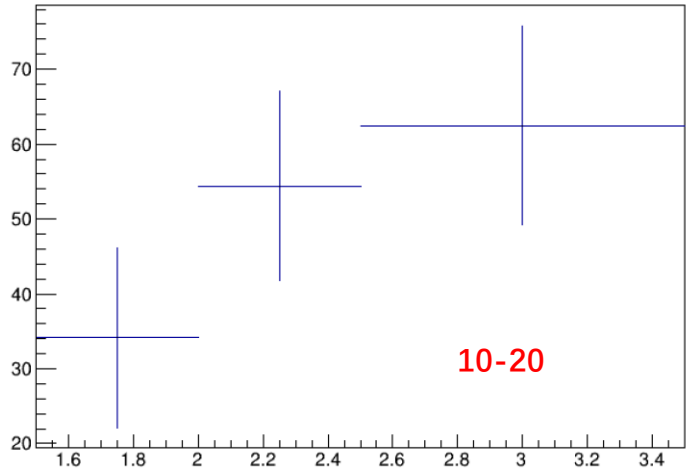


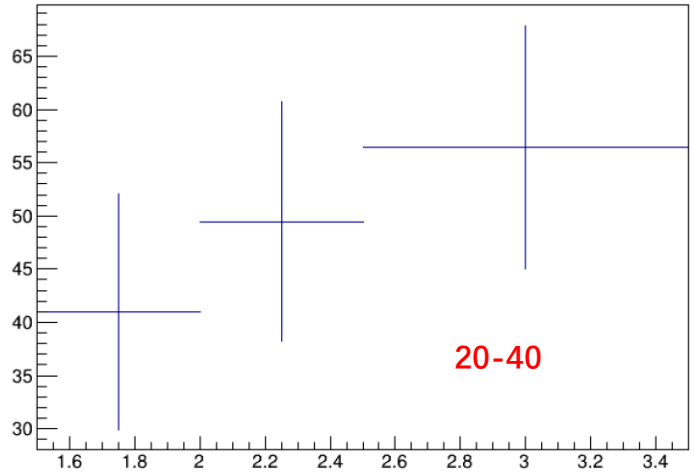


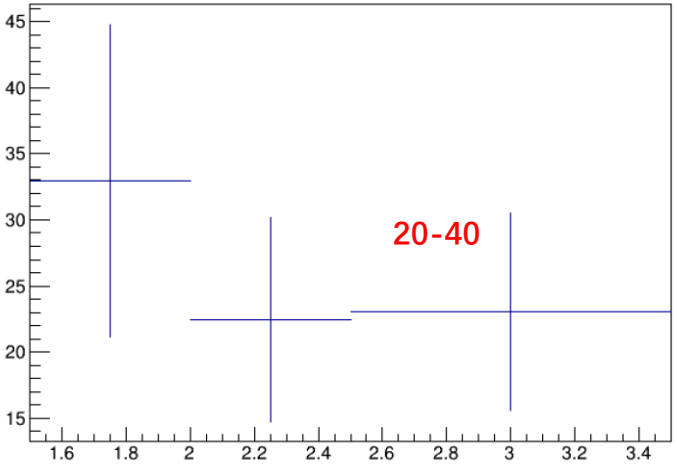


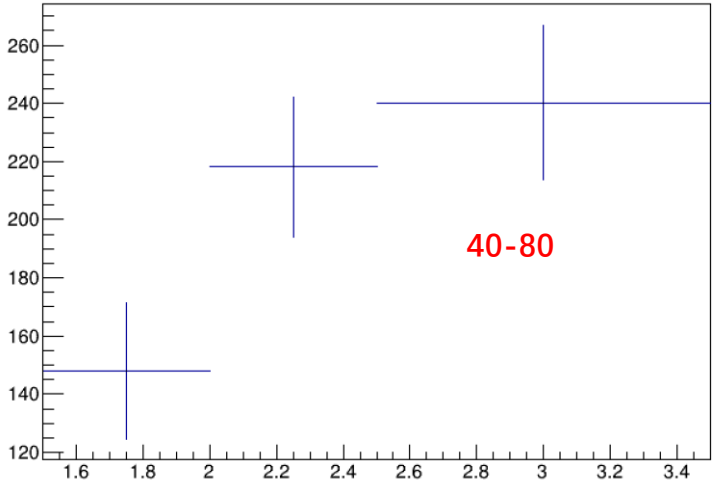
Raw Yield



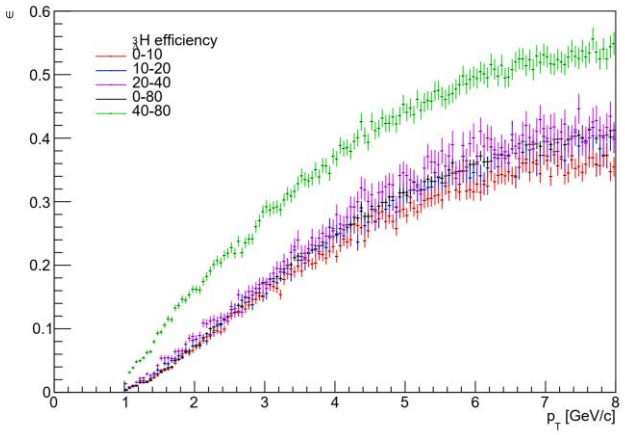


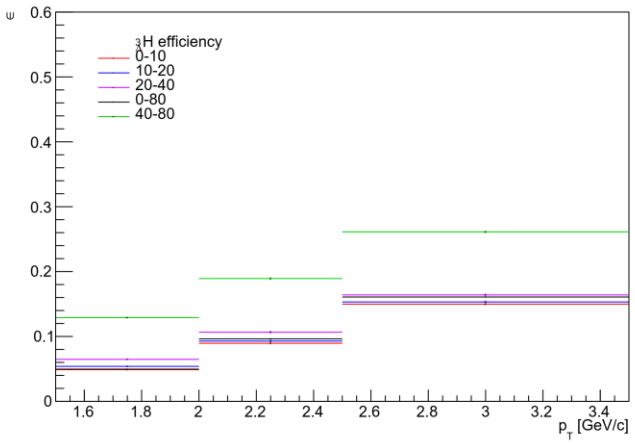


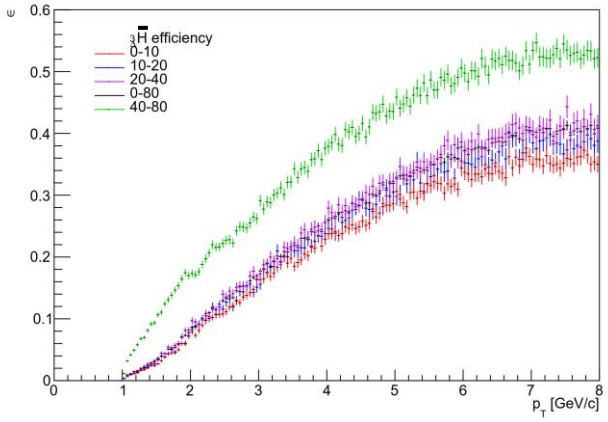


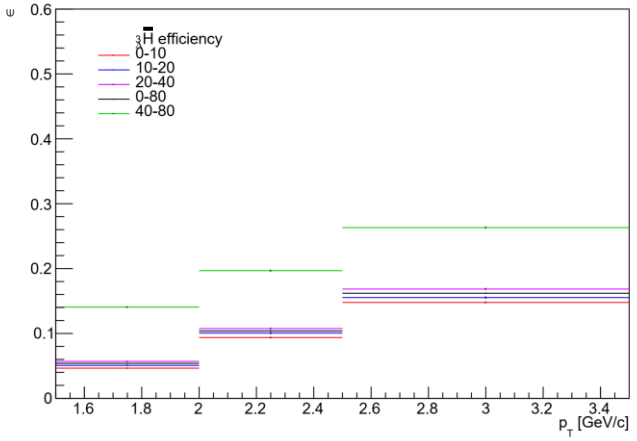


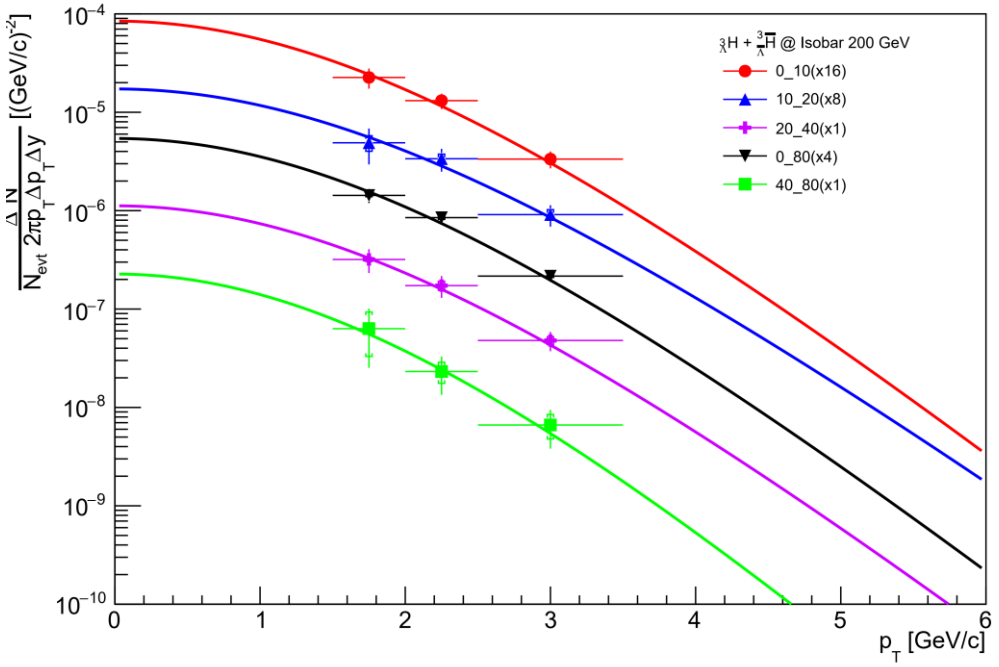
Corrected Spectra







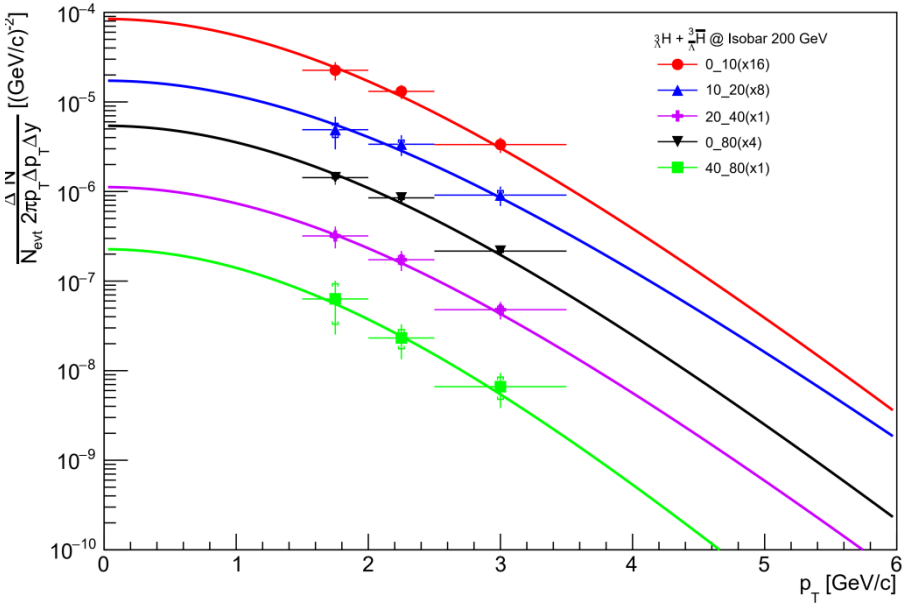




Systematics

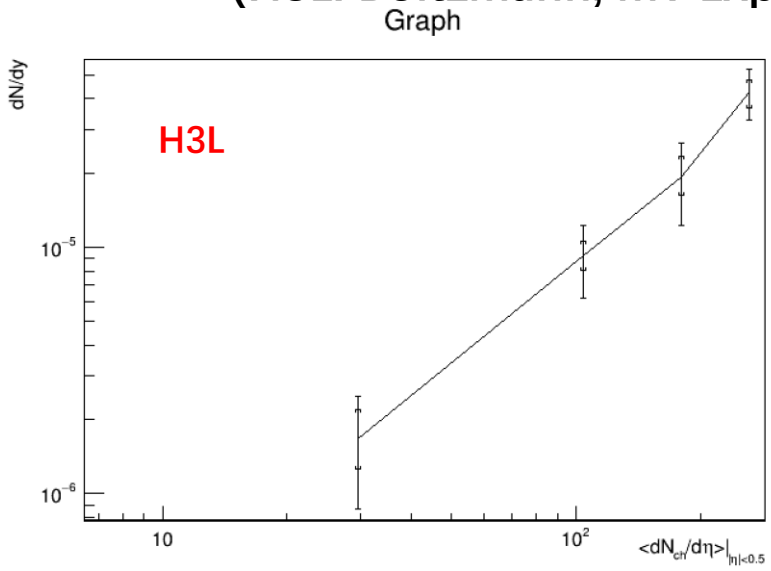
- Not using 0-80% to estimate systematics of other centralities now
- Do Barlow test

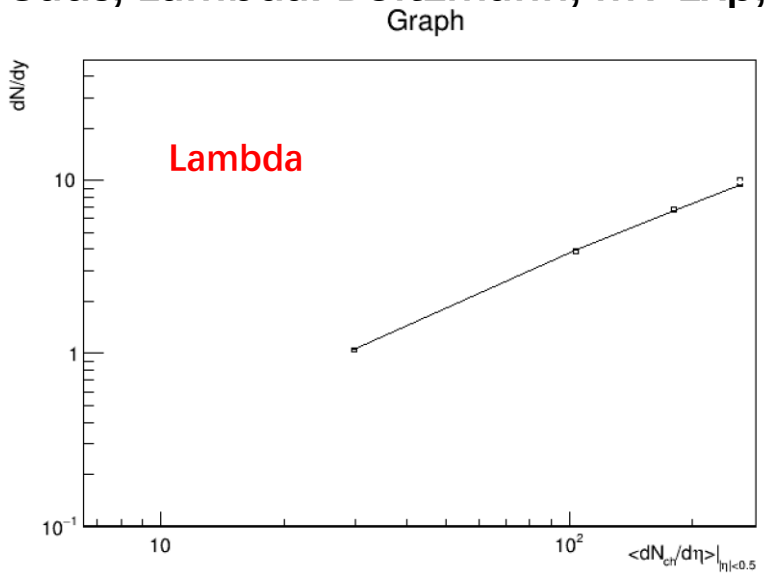
pm	0_10	No.1 Bin	sys_ana_cuts:	0.05214	tracking	0	sys_mass_window 0		total:	0.05214	
pm	0_10	No.2 Bin	sys_ana_cuts:	0.056	tracking	0.0266	sys_mass_window 0		total:	0.06199	
pm	0_10	No.3 Bin	sys_ana_cuts:	0.07125	tracking	0.04423	sys_mass_window 0.02204		total:	0.08671	
pm	10_20	No.1 Bin	sys_ana_cuts:	0.1767	tracking	0.03448	sys_mass_window 0		total:	0.18	
pm	10_20	No.2 Bin	sys_ana_cuts:	0.114	tracking	0.002807	sys_mass_window 0		total:	0.114	
pm	10_20	No.3 Bin	sys_ana_cuts:	0.1209	tracking	0.01678	sys_mass_window 0.001431		total:	0.1221	
pm	20_40	No.1 Bin	sys_ana_cuts:	0.04537	tracking	0.01276	sys_mass_window 0.004928		total:	0.04739	
pm	20_40	No.2 Bin	sys_ana_cuts:	0.09376	tracking	0.01252	sys_mass_window 0.04749	total:	0.1058		
pm	20_40	No.3 Bin	sys_ana_cuts:	0.09205	tracking	0.004023	sys_mass_window 0		total:	0.09214	
pm	0_80	No.1 Bin	sys_ana_cuts:	0.02036	tracking	0.01718	sys_mass_window 0.006402		total:	0.0274	
pm	0_80	No.2 Bin	sys_ana_cuts:	0.03701	tracking	0.01743	sys_mass_window 0.0051	total:	0.04122		
pm	0_80	No.3 Bin	sys_ana_cuts:	0.03086	tracking	0.002402	sys_mass_window 0		total:	0.03095	
pm	40_80	No.1 Bin	sys_ana_cuts:	0.4767	tracking	0.02461	sys_mass_window 0		total:	0.4773	
pm	40_80	No.2 Bin	sys_ana_cuts:	0.2403	tracking	0	sys_mass_window 0.02293	total:	0.2414		
pm	40_80	No.3 Bin	sys_ana_cuts:	0.2772	tracking	0.0009814	sys_mass_window 0.02519	total:	0.2783		



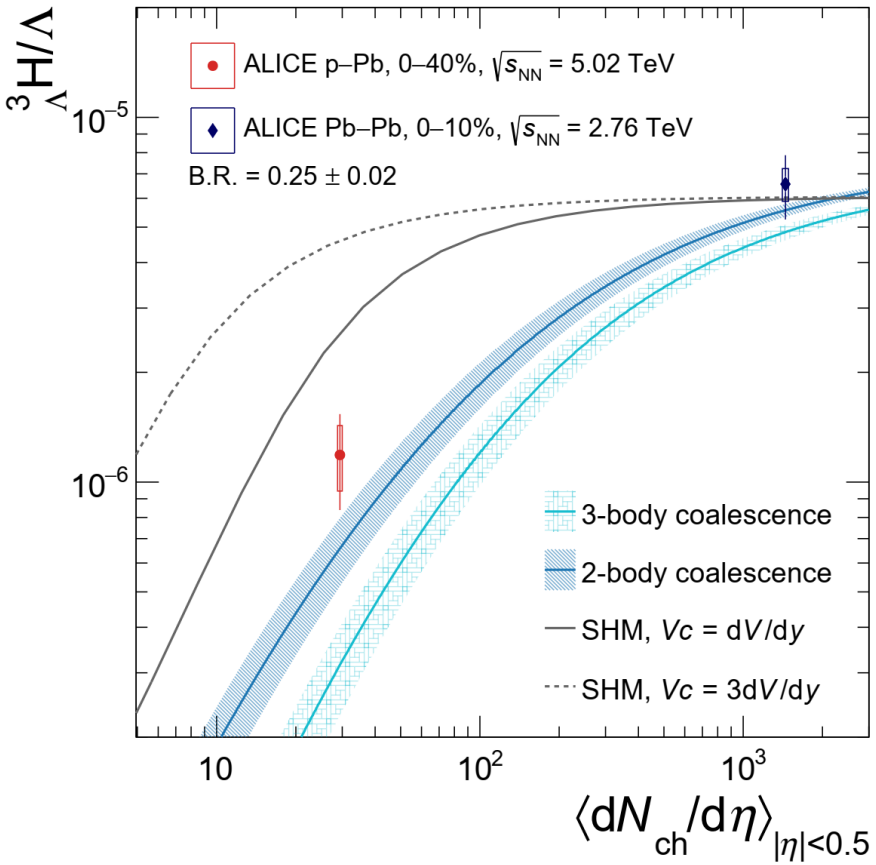
H3L and Lambda dNdy

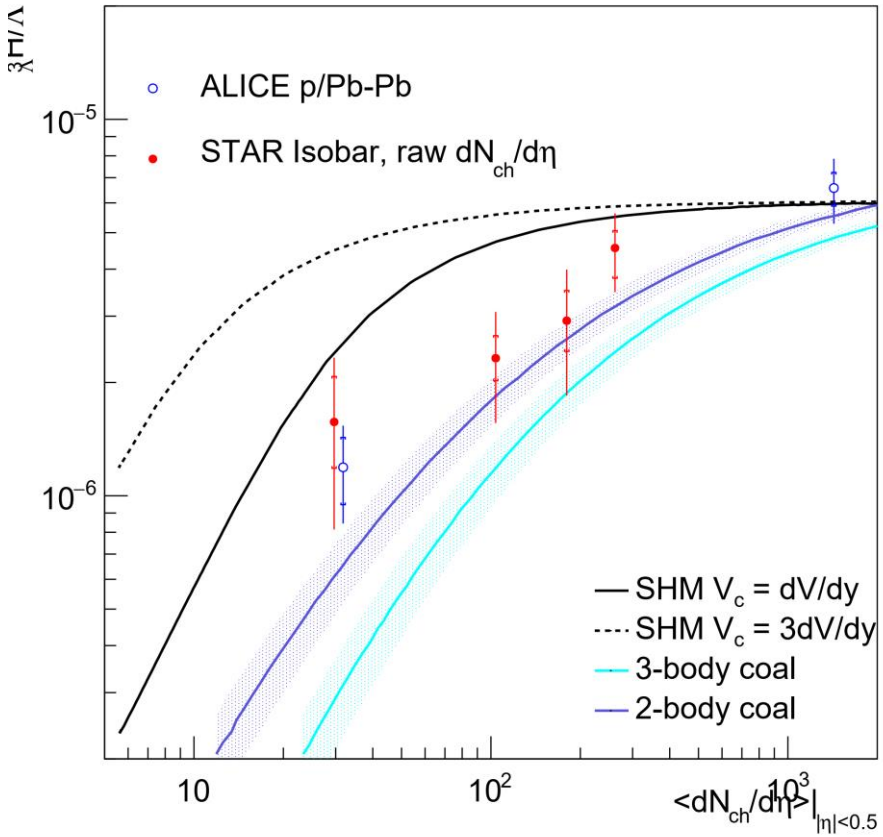
- Central value
  - Fit the spectra with statistic errors using Boltzmann(H3L) or Blast-wave(Lambda) function, integrate within pT [0,8]
- Statistic error
  - Fit errors from TFitResult
- Systematic error
  - Compare central values of default cut and all cut variations
  - Compare central values from different function choices with default cut
    (H3L: Boltzmann, mT Exp, pT Gaus; Lambda: Boltzmann, mT Exp, pT Exp, pT Gaus, pT^{3/2} Exp)





H3L/Lambda


ALICE p–Pb, 0–40%, $\sqrt{s_{NN}}$ = 5.02 TeV
ALICE Pb–Pb, 0–10%, $\sqrt{s_{NN}}$ = 2.76 TeV
B.R. = 0.25 ± 0.02
3-body coalescence
2-body coalescence
SHM, Vc = dV/dy
SHM, Vc = 3dV/dy
$^3_\Lambda H/\Lambda$
$\langle dN_{ch}/d\eta \rangle_{|\eta|<0.5}$


ALICE p/Pb-Pb
STAR Isobar, raw $dN_{ch}/d\eta$
SHM V_c = dV/dy
SHM V_c = 3dV/dy
3-body coal
2-body coal
$^3_\Lambda H/\Lambda$
$\langle dN_{ch}/d\eta \rangle_{|\eta|<0.5}$