Bump hunt part II

Reaction

$$\gamma\, p \rightarrow K^{+}K^{+}\Xi^{-}\pi^{0}$$

Reaction

$$\gamma\, p \rightarrow K^{+}K^{+}\Xi^{-}\pi^{0},$$

where $\Xi^{-} \rightarrow \Lambda\pi^{-}$

Reaction

$$\gamma\, p \rightarrow K^{+}K^{+}\Xi^{-}\pi^{0},$$

where $\Xi^{-} \rightarrow \Lambda\pi^{-}$

and $\Lambda \rightarrow p\pi^{-}$

Reaction

$$\gamma\, p \rightarrow K^{+}K^{+}\Xi^{-}\pi^{0},$$

where $\Xi^{-} \rightarrow \Lambda\pi^{-}$

and $\Lambda \rightarrow p\pi^{-}$

- Mass of Ξ^{-} not constrained

IMPORTANT POINT

- At this point, I am looking for interesting bumps
- Any mass[$\Xi\pi$] bump, other than the $\Xi^*(1530)$, is to be taken as merely suggestive

$\Xi(1620)$: From 1-star

Nucleon resonances are rated using the "star" system:

* Poor evidence of existence

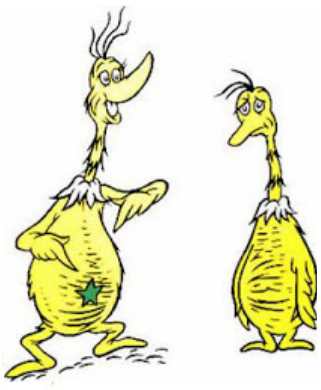
$\Xi(1620)$ $I(J^P) = \frac{1}{2}(?^?)$ Status: *
J, P need confirmation.

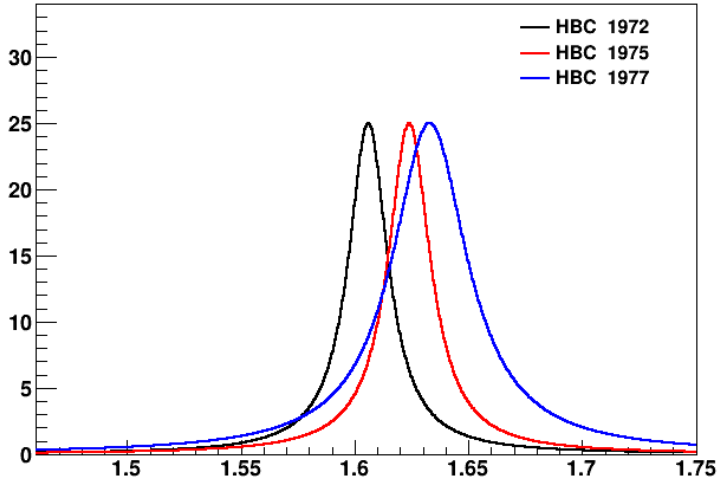
OMITTED FROM SUMMARY TABLE

What little evidence there is consists of weak signals in the $\Xi\pi$ channel. A number of other experiments (e.g., BORENSTEIN 72 and HASSALL 81) have looked for but not seen any effect.

$\Xi(1620)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
≈ 1620 OUR ESTIMATE					
1624± 3	31	BRIEFEL	77	HBC	$K^- p$ 2.87 GeV/c
1633±12	34	DEBELLEFON	75B	HBC	$K^- p \to \Xi^- \overline{K}\pi$
1606± 6	29	ROSS	72	HBC	$K^- p$ 3.1–3.7 GeV/c





$\Xi(1620)$: From 1-star to 2-star

Nucleon resonances are rated using the "star" system:

* Poor evidence of existence

** Fair evidence of existence

$\Xi(1620)$ $I(J^P) = \frac{1}{2}(?^?)$ Status: *

J, *P* need confirmation.

OMITTED FROM SUMMARY TABLE

What little evidence there is consists of weak signals in the $\Xi\pi$ channel. A number of other experiments (e.g., BORENSTEIN 72 and HASSALL 81) have looked for but not seen any effect.

$\Xi(1620)$ MASS

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1633±12	34	DEBELLEFON	75B	HBC	$K^- p \to \Xi^- \overline{K}\pi$
1606± 6	29	ROSS	72	HBC	$K^- p$ 3.1–3.7 GeV/c

Citation: S. Navas *et al.* (Particle Data Group), Phys. Rev. D **110**, 030001 (2024)

$\Xi(1620)$ $I(J^P) = \frac{1}{2}(?^?)$ Status: **

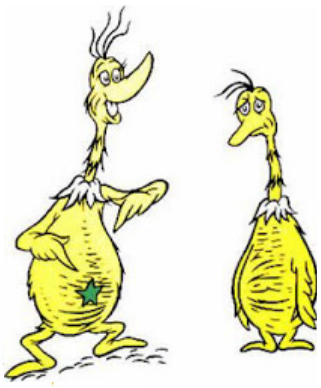
J, *P* need confirmation.

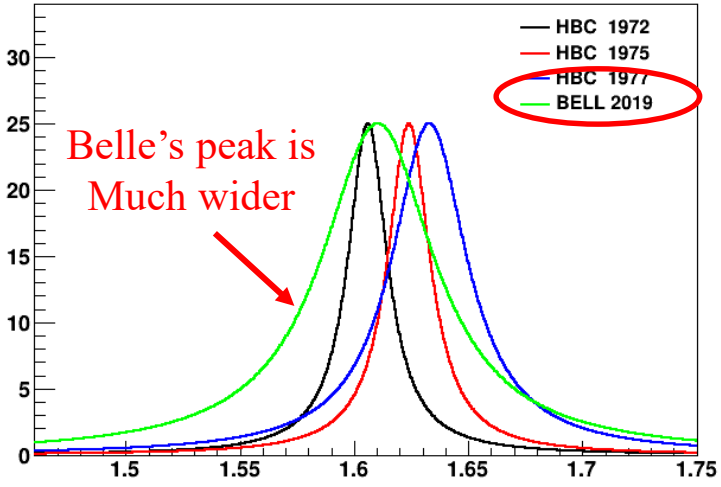
OMITTED FROM SUMMARY TABLE

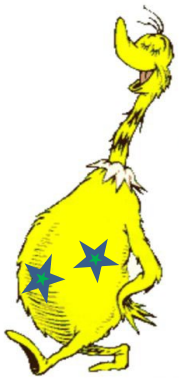
The clearest evidence is a peak in $\Xi^-\pi^+$ seen by SUMIHAMA 19. Older low-statistics experiments (e.g., BORENSTEIN 72 and HASSALL 81) have looked for the state but have not seen any effect.

$\Xi(1620)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
≈ 1620 OUR ESTIMATE					
$1610.4 \pm 6.0^{+6.1}_{-4.2}$		SUMIHAMA	19	BELL	$\Xi_c^+ \to \Xi(1620)\pi^+$
1624 ± 3	31	BRIEFEL	77	HBC	$K^- p$ 2.87 GeV/c
1633 ±12	34	DEBELLEFON	75B	HBC	$K^- p \to \Xi^- \overline{K}\pi$
1606 ± 6	29	ROSS	72	HBC	$K^- p$ 3.1–3.7 GeV/c



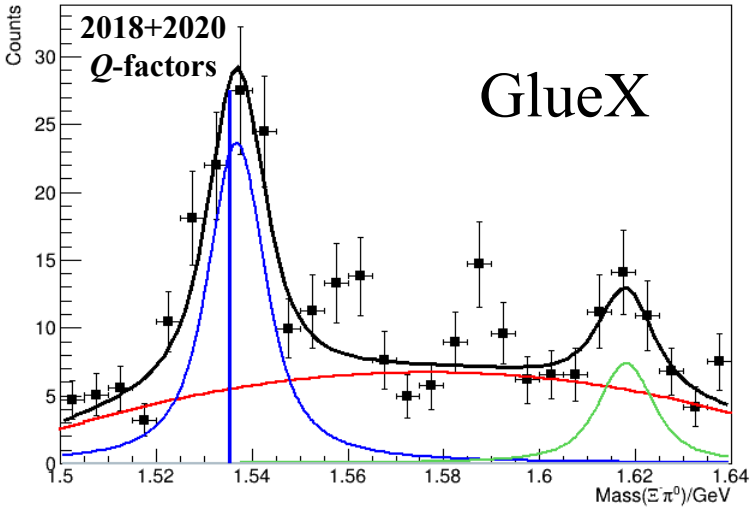


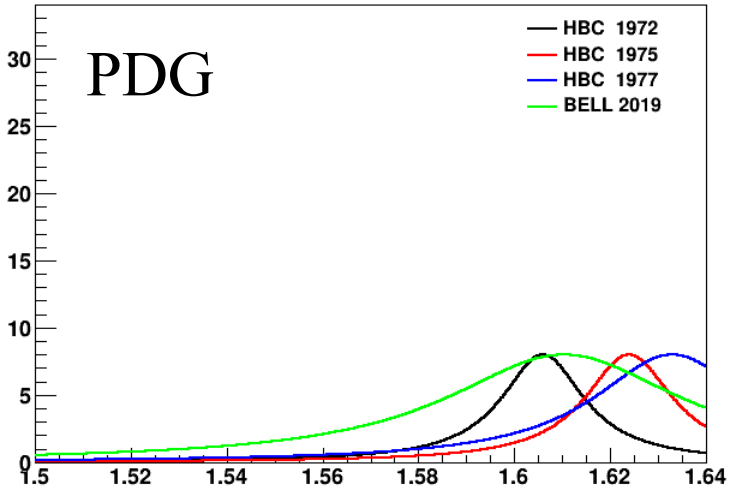


Assumed bump structure, compared to PDG

Narrow bump

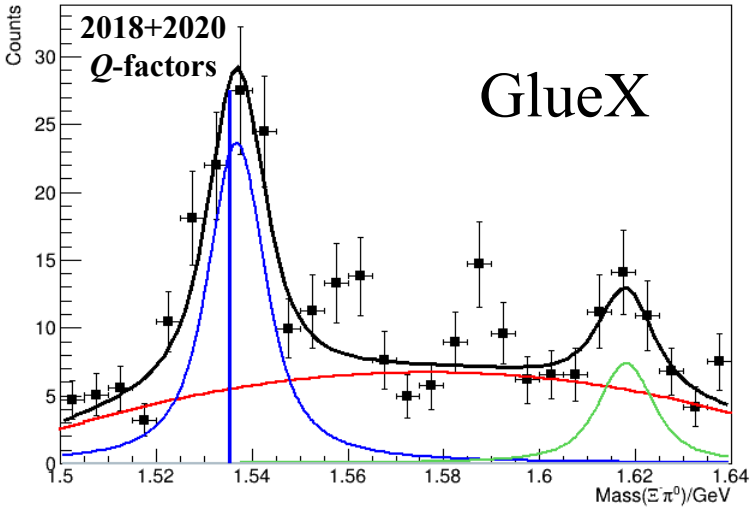
Wide bump

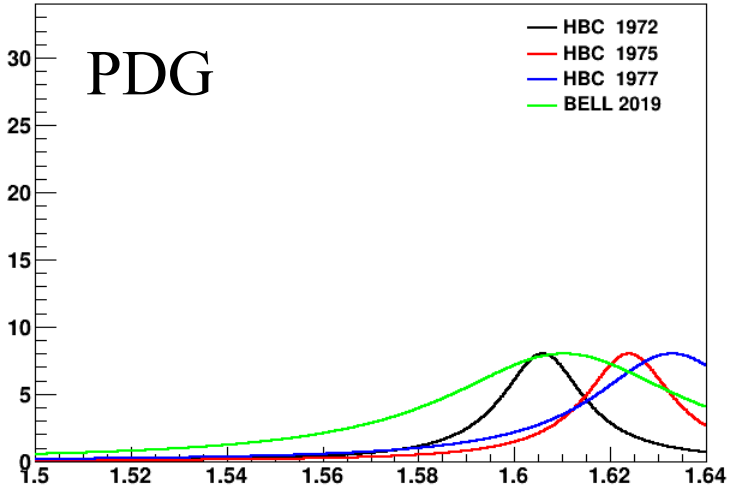




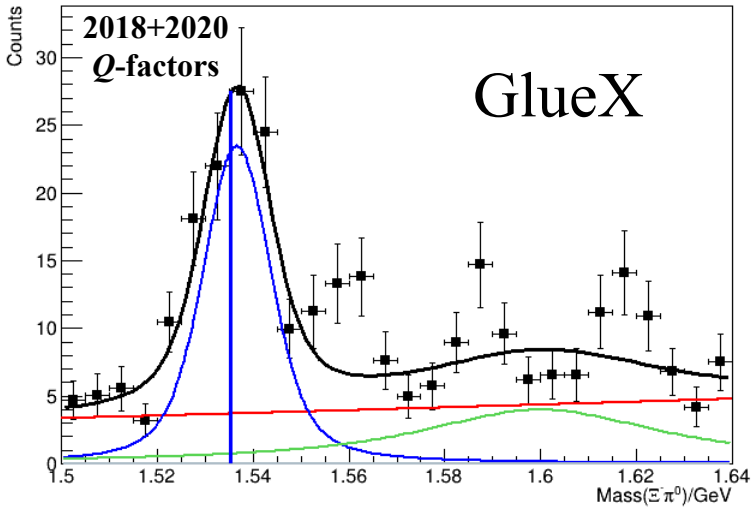
Assumed bump structure, compared to PDG

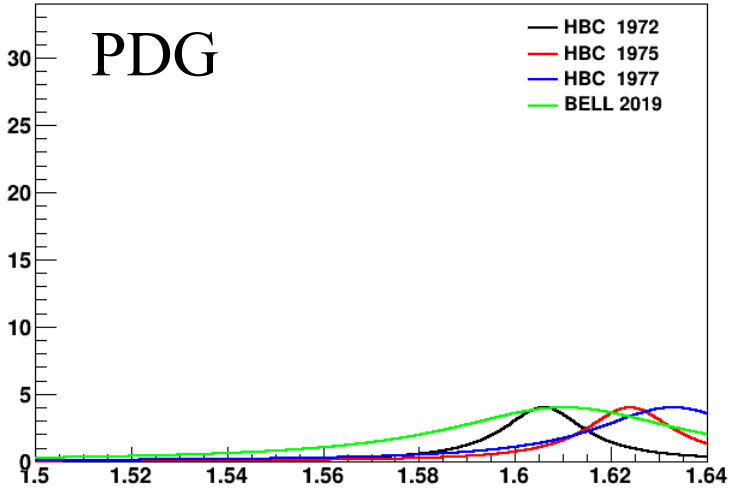
Narrow bump





Wide bump

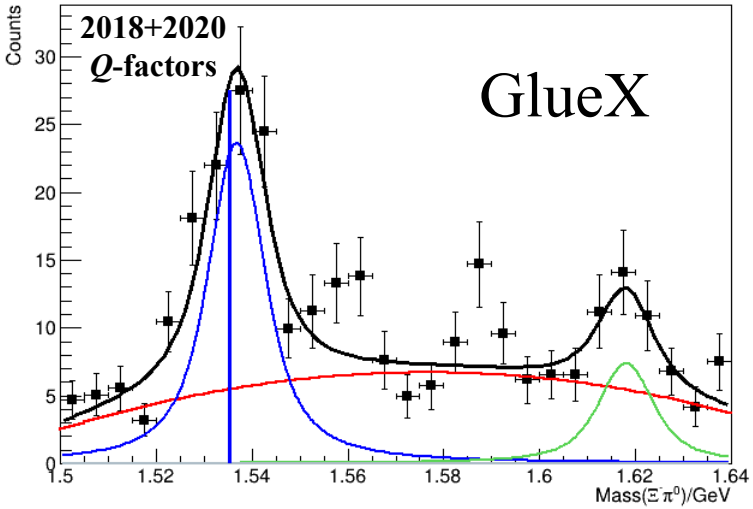


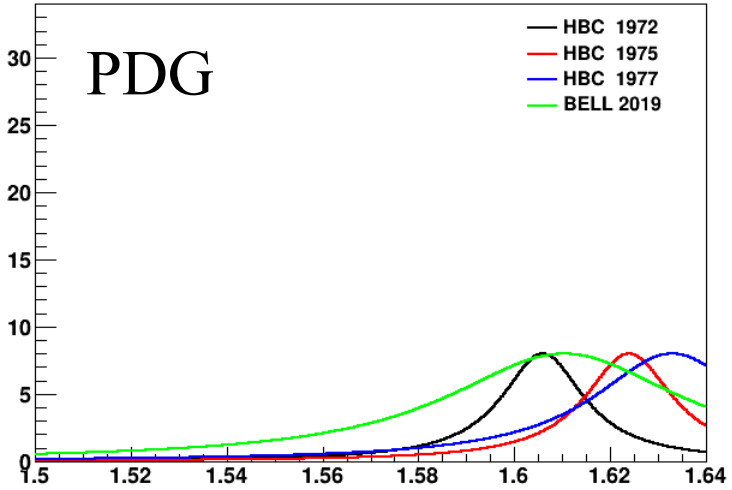


ASU

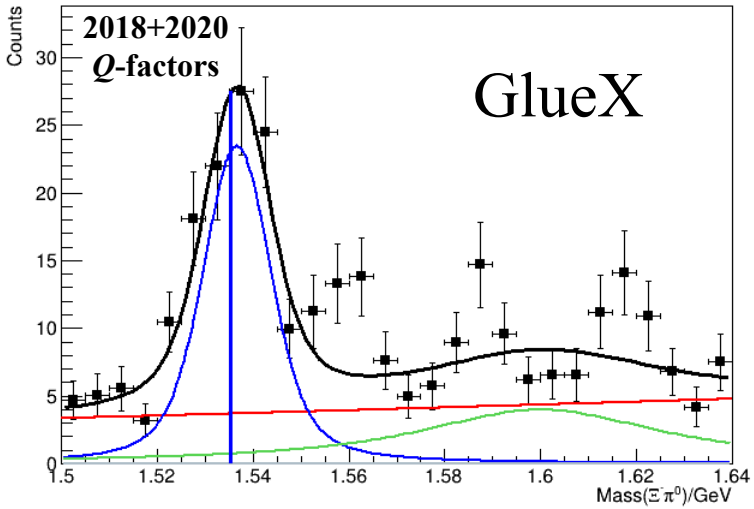
Assumed bump structure, compared to PDG

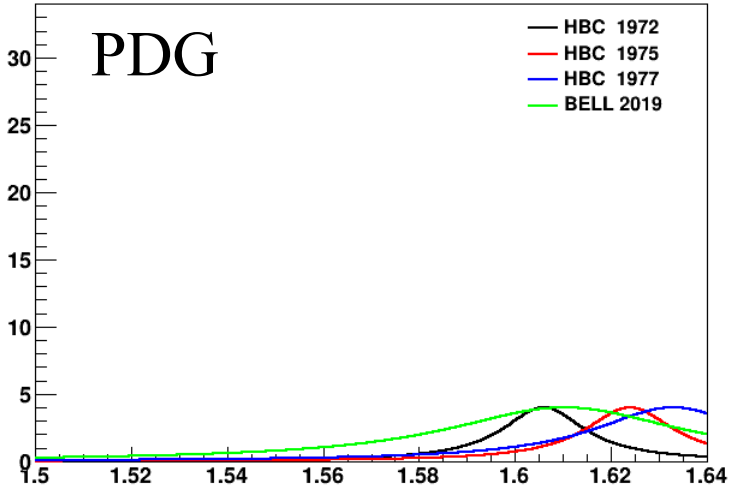
Narrow bump





Wide bump





- Perhaps *Q*-factors were implemented incorrectly ☹

Assumed bump structure, compared to Belle

Target shoot Belle:

Assumed bump structure, compared to Belle

Target shoot Belle:

- Changing CL cut to CL>10^{-4}

Assumed bump structure, compared to Belle

Target shoot Belle:

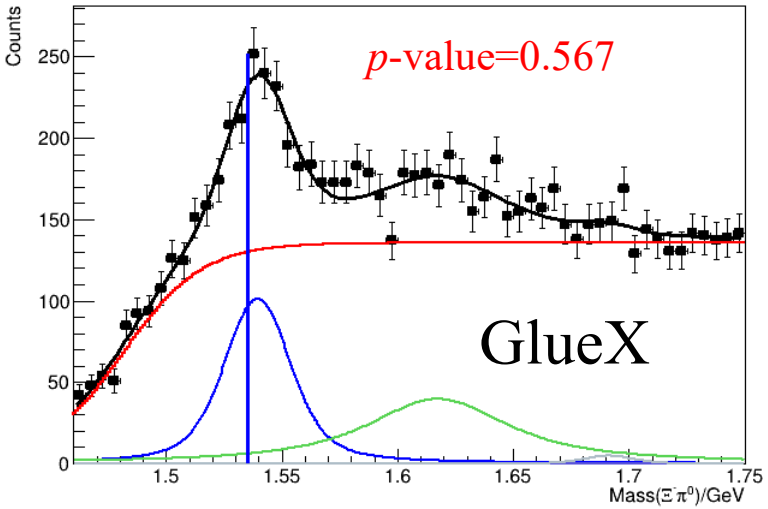
- Changing CL cut to CL>10^{-4}
- Removing *Q*-factors

Assumed bump structure, compared to Belle

Target shoot Belle:

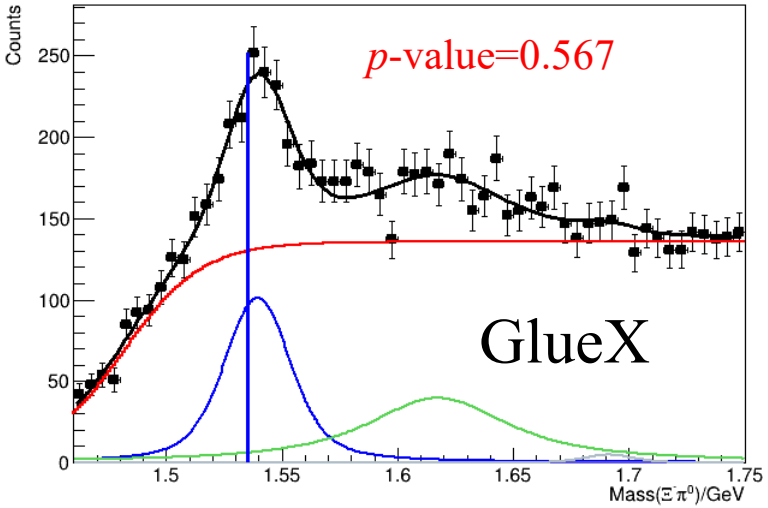
- Changing CL cut to CL>10^{-4}
- Removing *Q*-factors
- Change fit range to match that of Belle

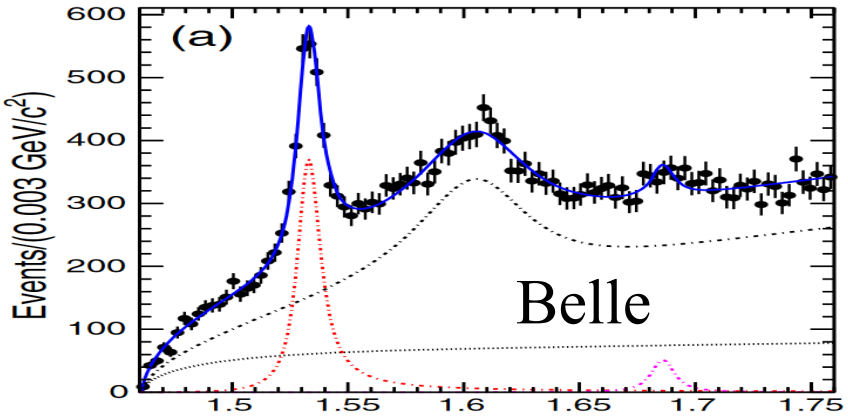
Assumed bump structure, compared to Belle



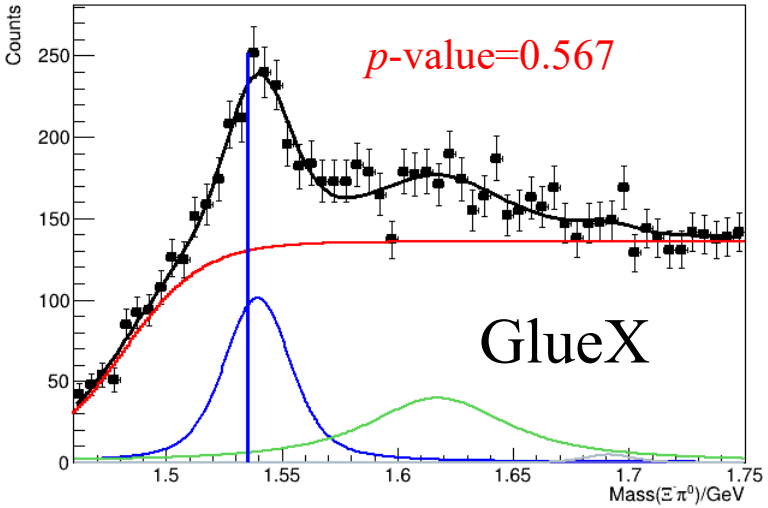
Background (red) :
[First order polynomial]*[sigmoid]

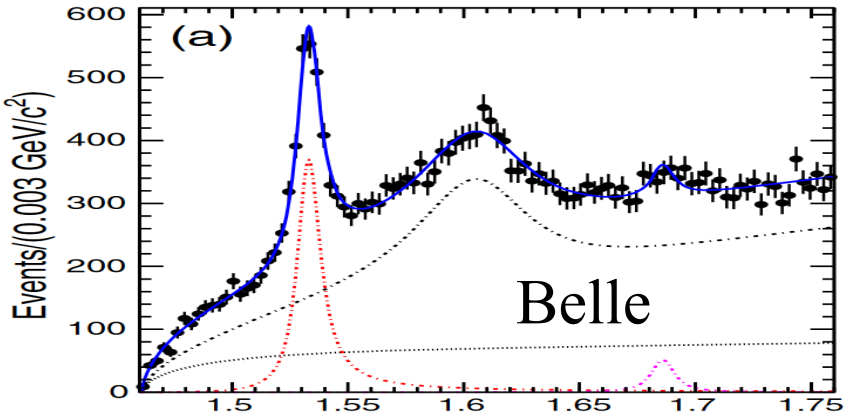
Assumed bump structure, compared to Belle





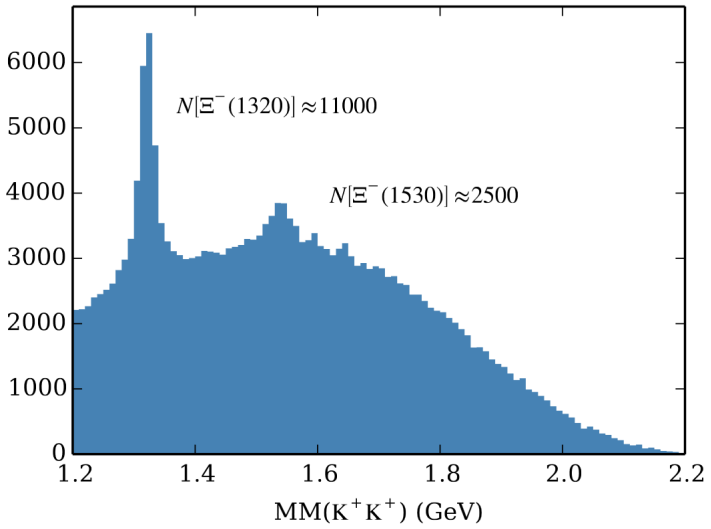
Assumed bump structure, compared to Belle





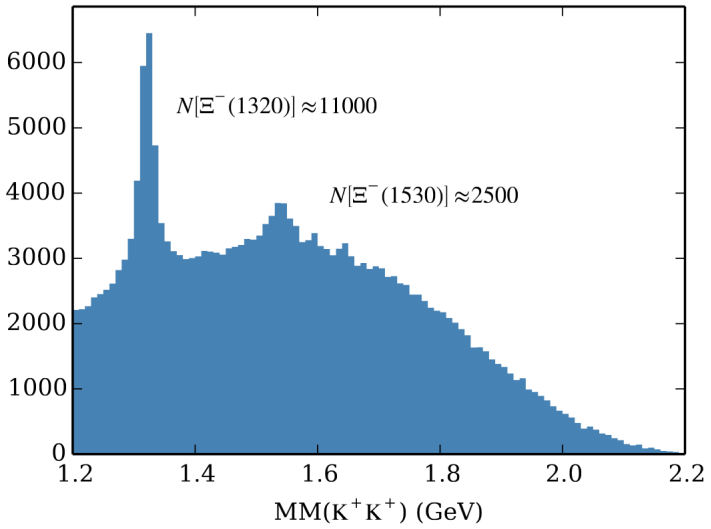
- Looks reasonable ☺

CLAS Ξ and $\Xi(1530)$



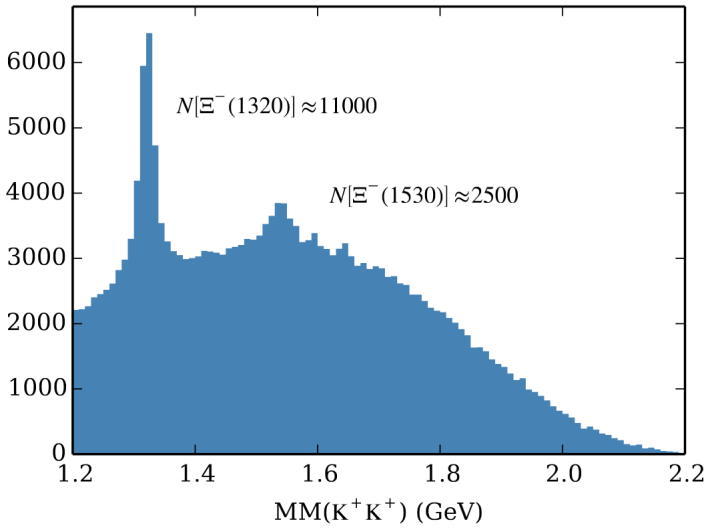
- Reaction: $\gamma\, p \rightarrow K^+\, K^+\, X$

CLAS Ξ and $\Xi(1530)$



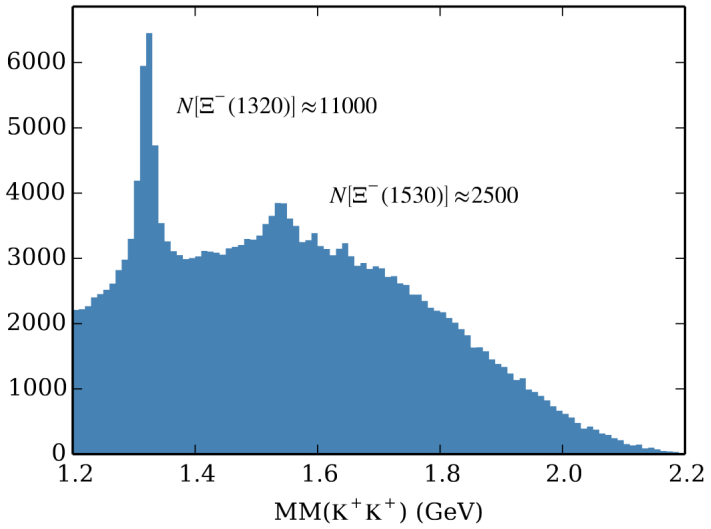
- Reaction: $\gamma\, p \rightarrow K^+\, K^+\, X$
- Here, X represent the missing particle(s)

CLAS Ξ and $\Xi(1530)$



- Reaction: $\gamma\, p \rightarrow K^+\, K^+\, X$
- Here, X represent the missing particle(s)
- Ostensibly, X is Ξ^- or Ξ^{-*}
  - from $\gamma\, p \rightarrow K^+\, Y^*$, where $Y^* \rightarrow K^+\, \Xi^-$

CLAS Ξ and $\Xi(1530)$



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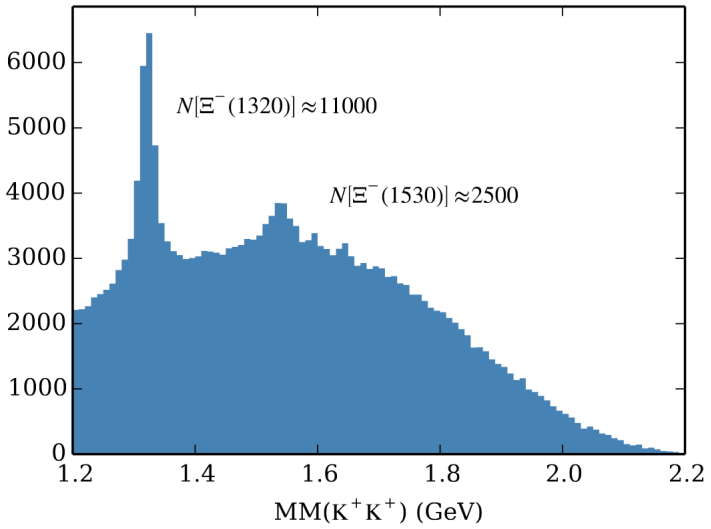
- $E_\gamma < 5.4$ GeV

CLAS Ξ and $\Xi(1530)$



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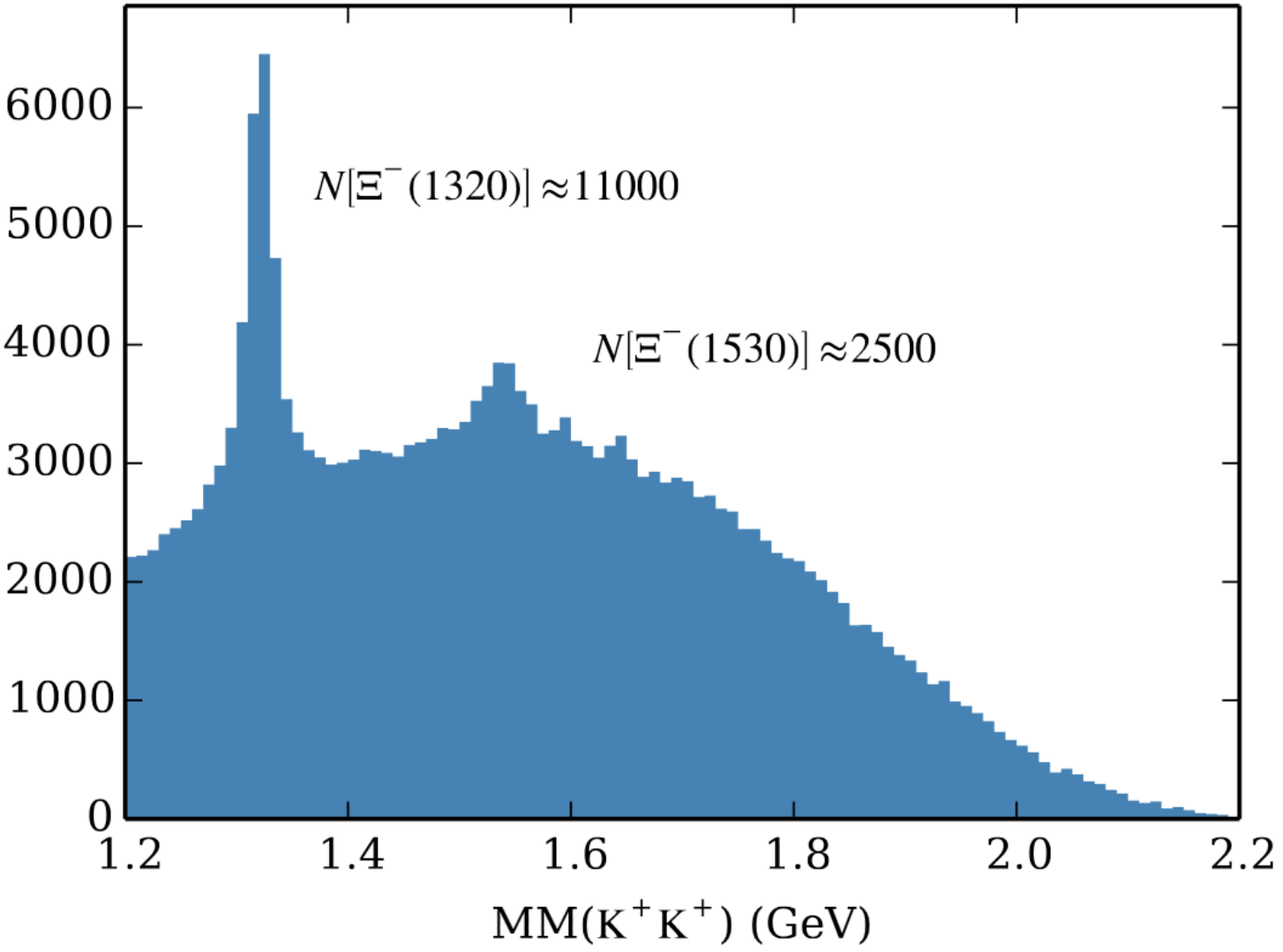
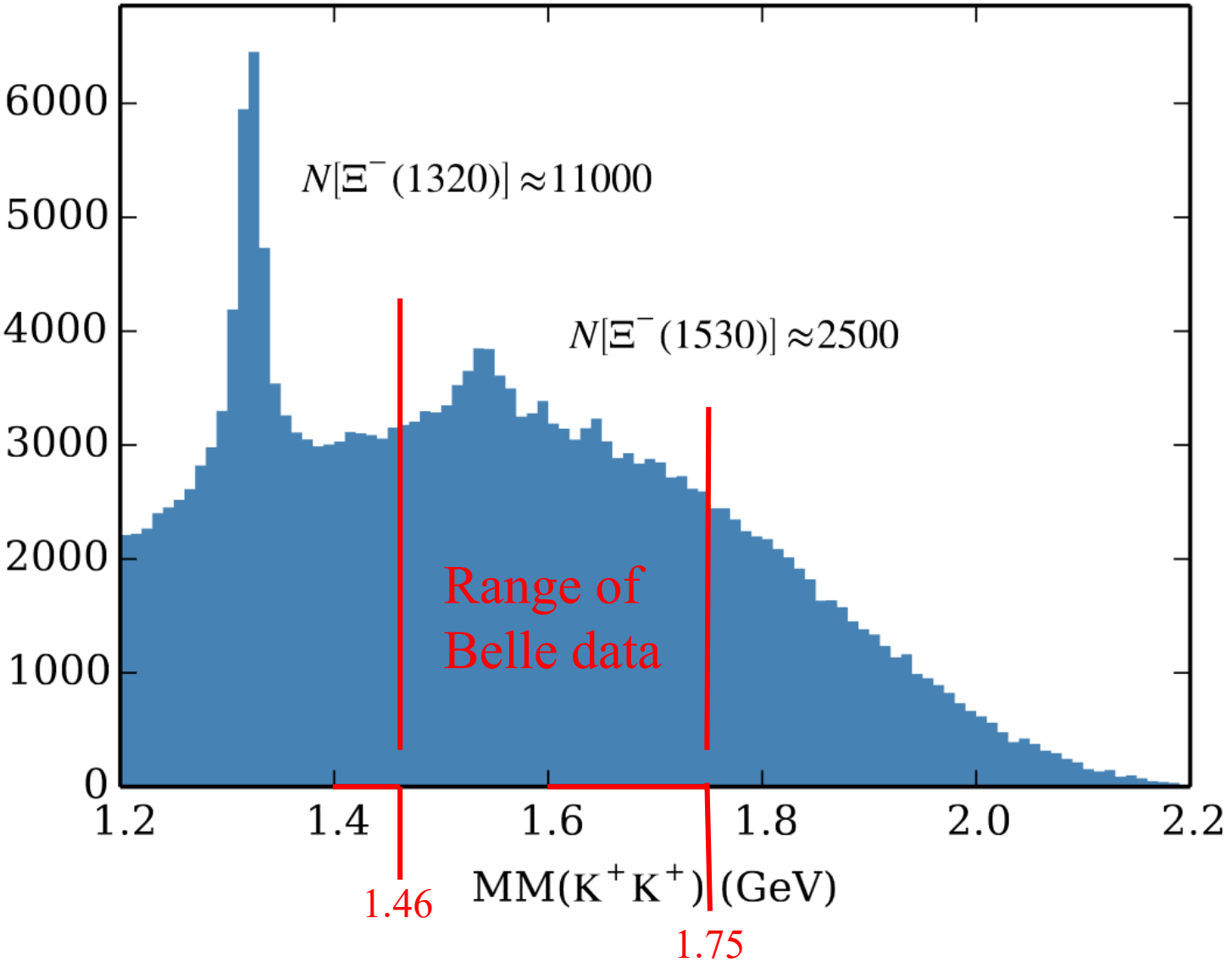
- Ostensibly, X is Ξ^- or Ξ^{-*}
  - from $\gamma\, p \rightarrow K^+\, Y^*$, where $Y^* \rightarrow K^+\, \Xi^-$
- $E_\gamma < 5.4$ GeV

- A lot of background from many types of final states
  - $\gamma\, p \rightarrow K^+\, K^+\, X$ is very inclusive of Ξ^{-*} type states with decays NOT limited to
    - $\Xi\pi$
    - $\Xi^*\pi$
    - ΛK
    - $K\Sigma$
    - or ?

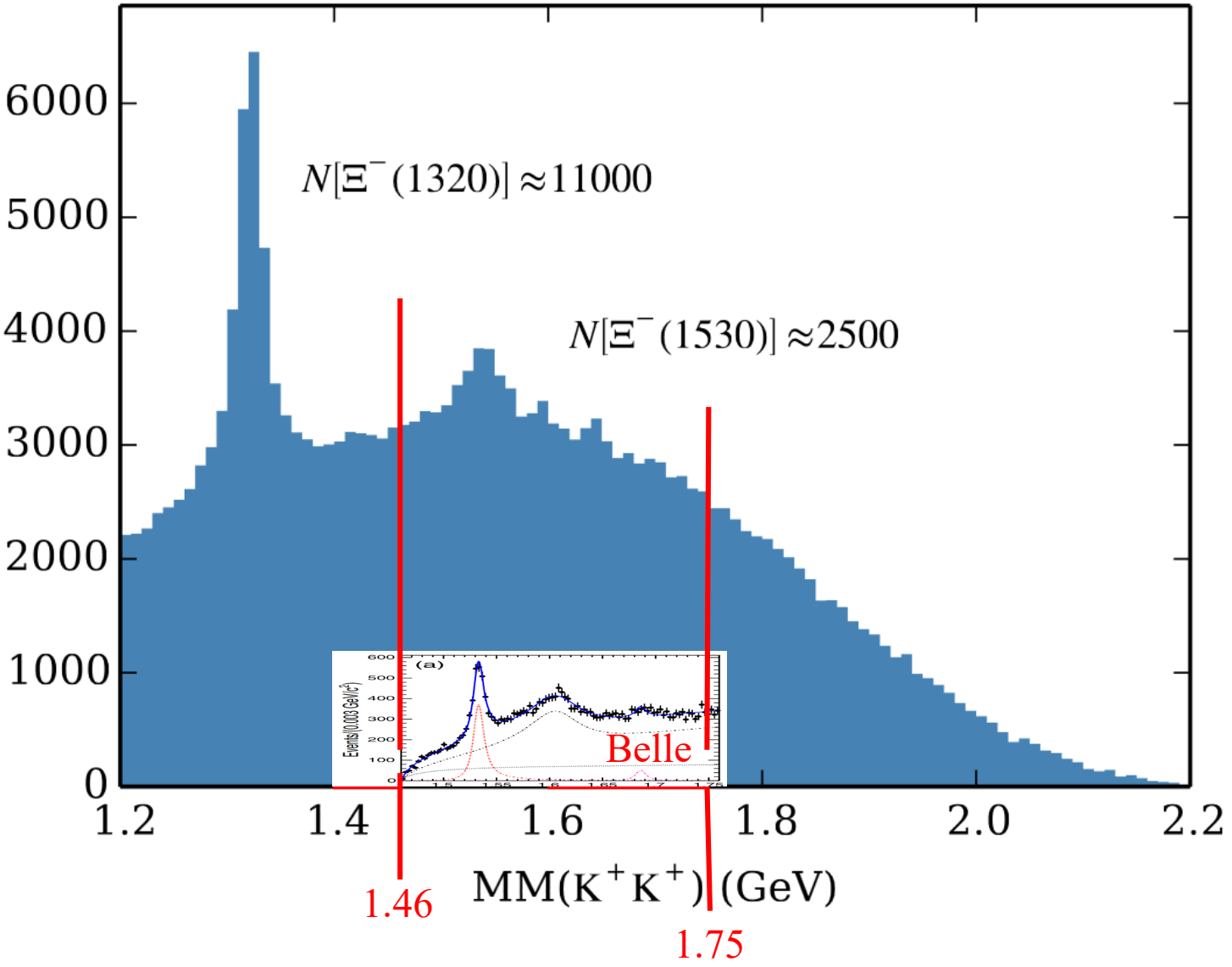
CLAS comparison



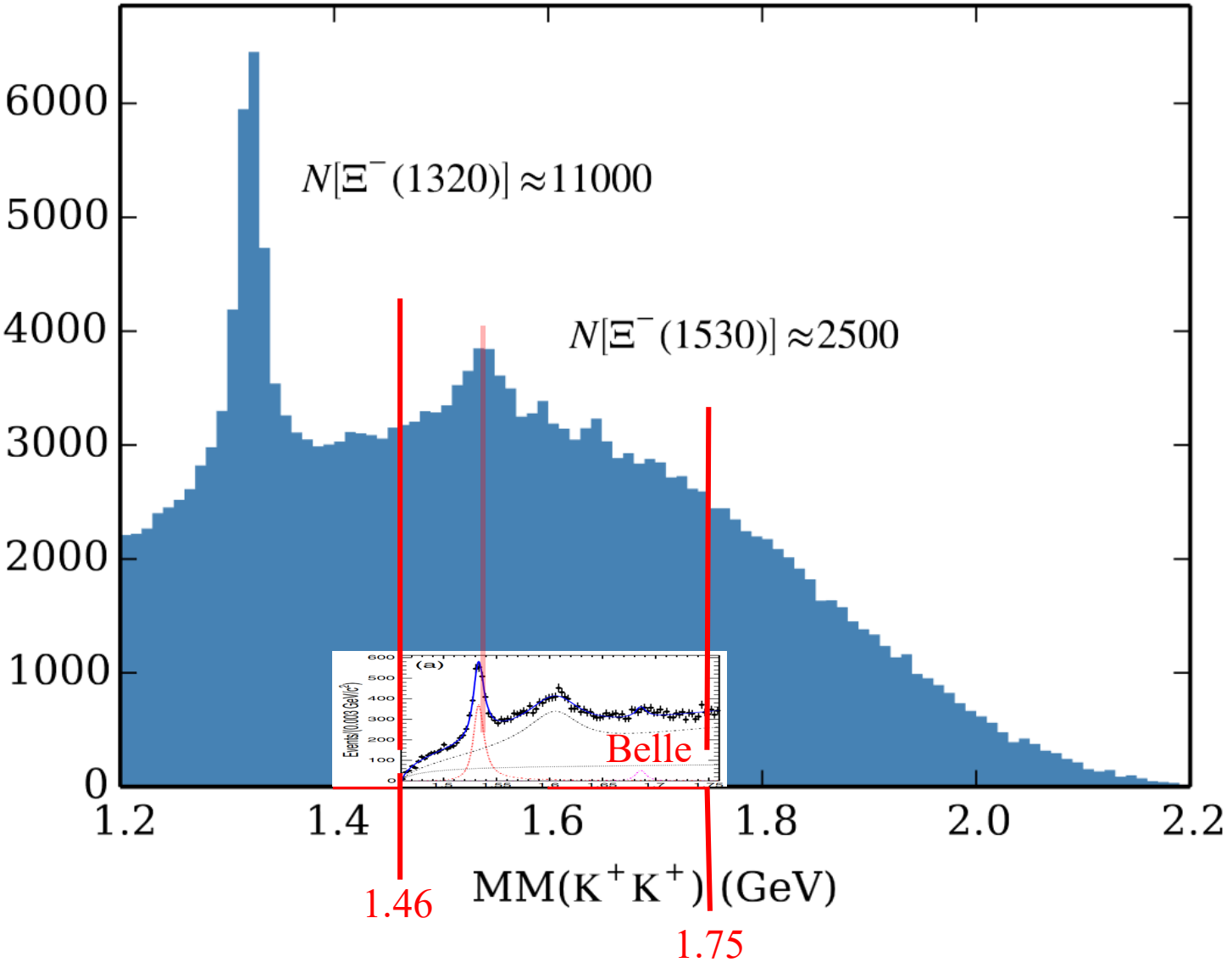
CLAS comparison



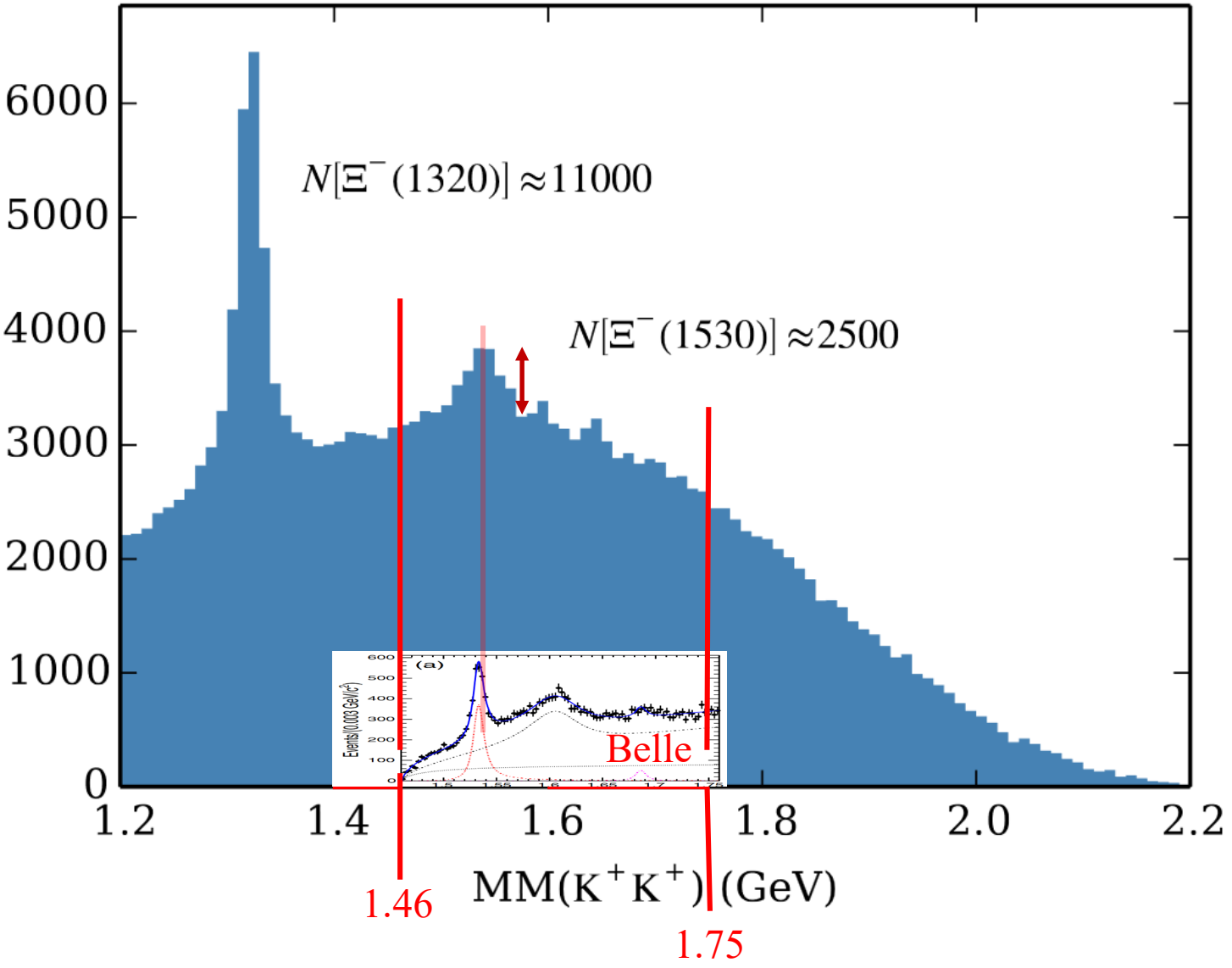
CLAS comparison



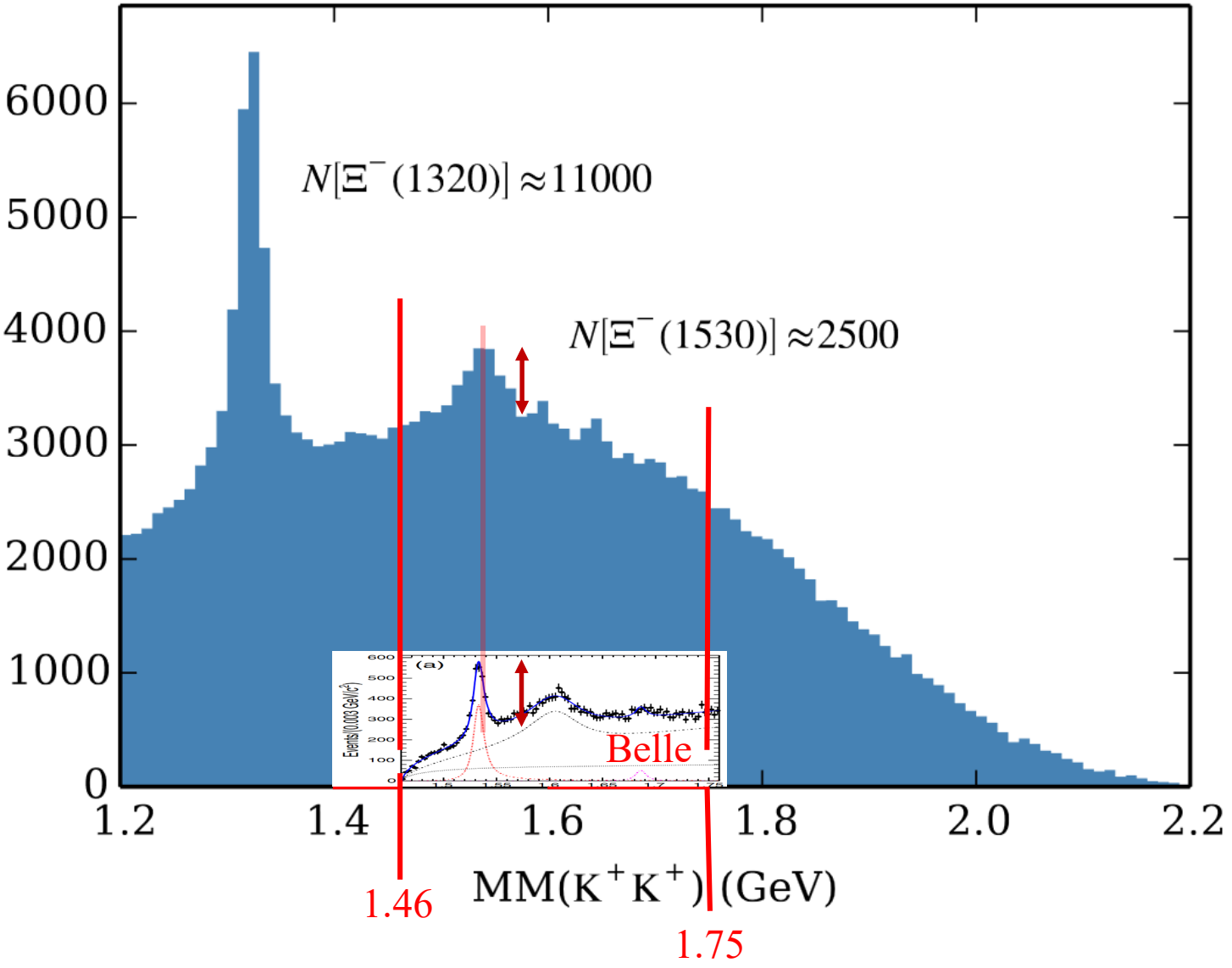
CLAS comparison



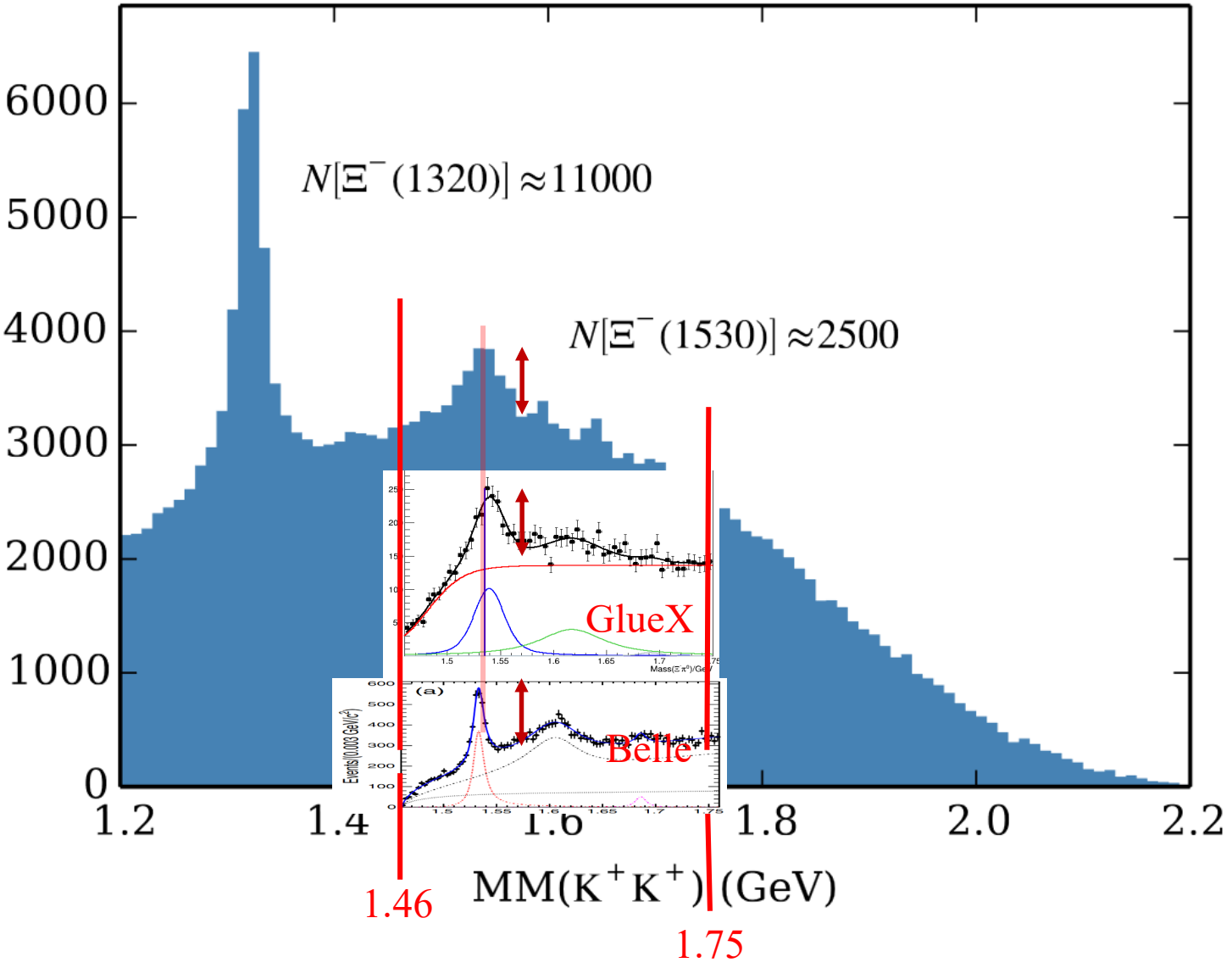
CLAS comparison



CLAS comparison



CLAS comparison



Reaction

$$\gamma p \rightarrow K^+K^+\Xi^-\pi^0,$$

where $\Xi^- \rightarrow \Lambda\pi^-$

and $\Lambda \rightarrow p\pi^-$

- Mass of Ξ^- not constrained
- The Ξ^- has a long lifetime

Ξ^- MEAN LIFE

Measurements with an error > 0.2×10^{-10} s or with systematic errors not included have been omitted.

VALUE (10^{-10} s)	EVTS	DOCUMENT ID		TECN	COMMENT
1.639±0.015 OUR AVERAGE					
1.65 ±0.07 ±0.12	2478 ± 68	ABDALLAH	06E	DLPH	from Z decays
1.652±0.051	32k	BOURQUIN	84	SPEC	Hyperon beam
1.665±0.065	41k	BOURQUIN	79	SPEC	Hyperon beam
1.609±0.028	4286	HEMINGWAY	78	HBC	4.2 GeV/c K^-p
1.67 ±0.08		DIBIANCA	75	DBC	4.9 GeV/c K^-d
1.63 ±0.03	4303	BALTAY	74	HBC	1.75 GeV/c K^-p
$1.73\ ^{+0.08}_{-0.07}$	680	MAYEUR	72	HLBC	2.1 GeV/c K^-
1.61 ±0.04	2610	DAUBER	69	HBC	
1.80 ±0.16	299	LONDON	66	HBC	
1.70 ±0.12	246	PJERROU	65B	HBC	
1.69 ±0.07	794	HUBBARD	64	HBC	
$1.86\ ^{+0.15}_{-0.14}$	517	JAUNEAU	63D	FBC	

Reaction

$$\gamma p \rightarrow K^+K^+\Xi^-\pi^0,$$

where $\Xi^- \rightarrow \Lambda\pi^-$

and $\Lambda \rightarrow p\pi^-$

- Mass of Ξ^- not constrained
- The Ξ^- has a long lifetime
  - Can cut on ΔVertex

Ξ^- MEAN LIFE

Measurements with an error > 0.2×10^{-10} s or with systematic errors not included have been omitted.

VALUE (10^{-10} s)	EVTS	DOCUMENT ID		TECN	COMMENT
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1.609±0.028	4286	HEMINGWAY	78	HBC	4.2 GeV/c K^-p
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$1.73\ ^{+0.08}_{-0.07}$	680	MAYEUR	72	HLBC	2.1 GeV/c K^-
1.61 ±0.04	2610	DAUBER	69	HBC	
1.80 ±0.16	299	LONDON	66	HBC	
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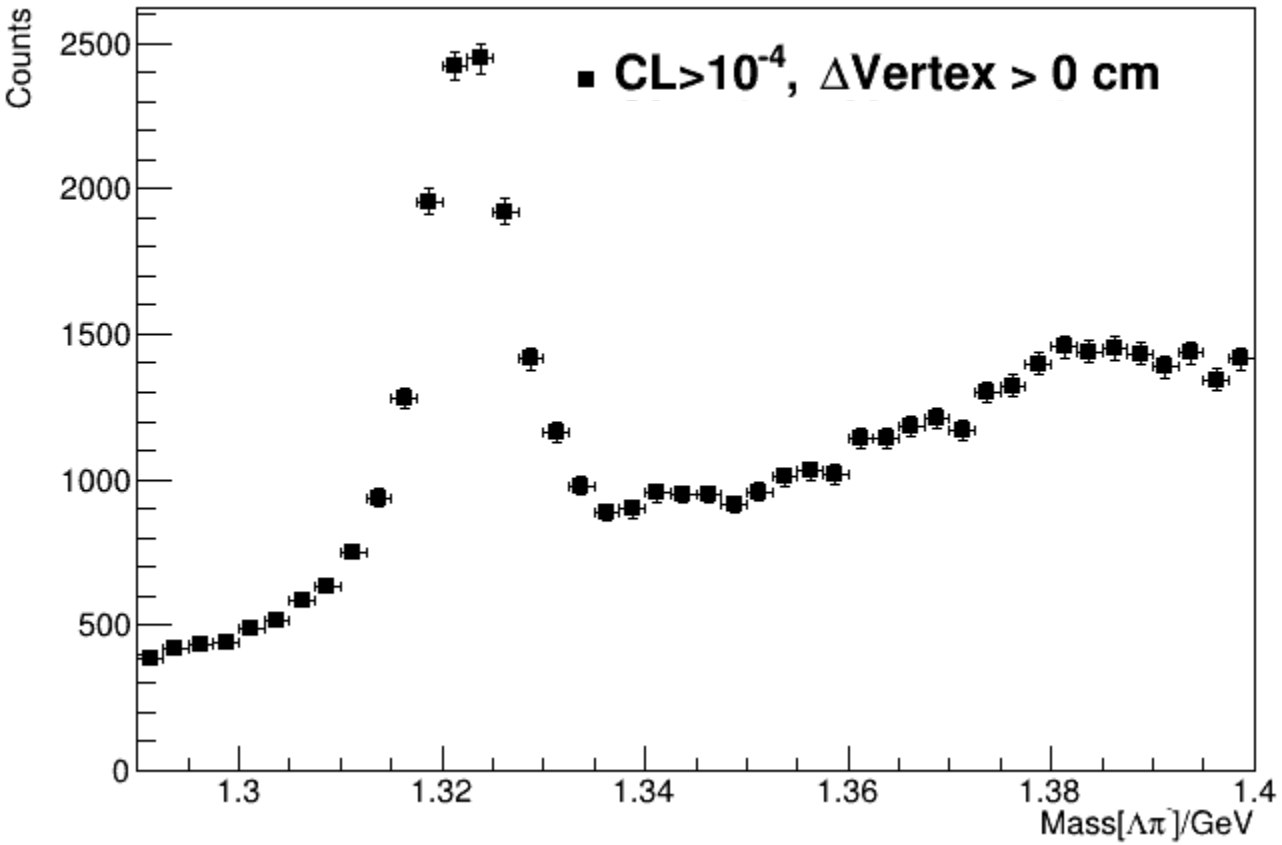
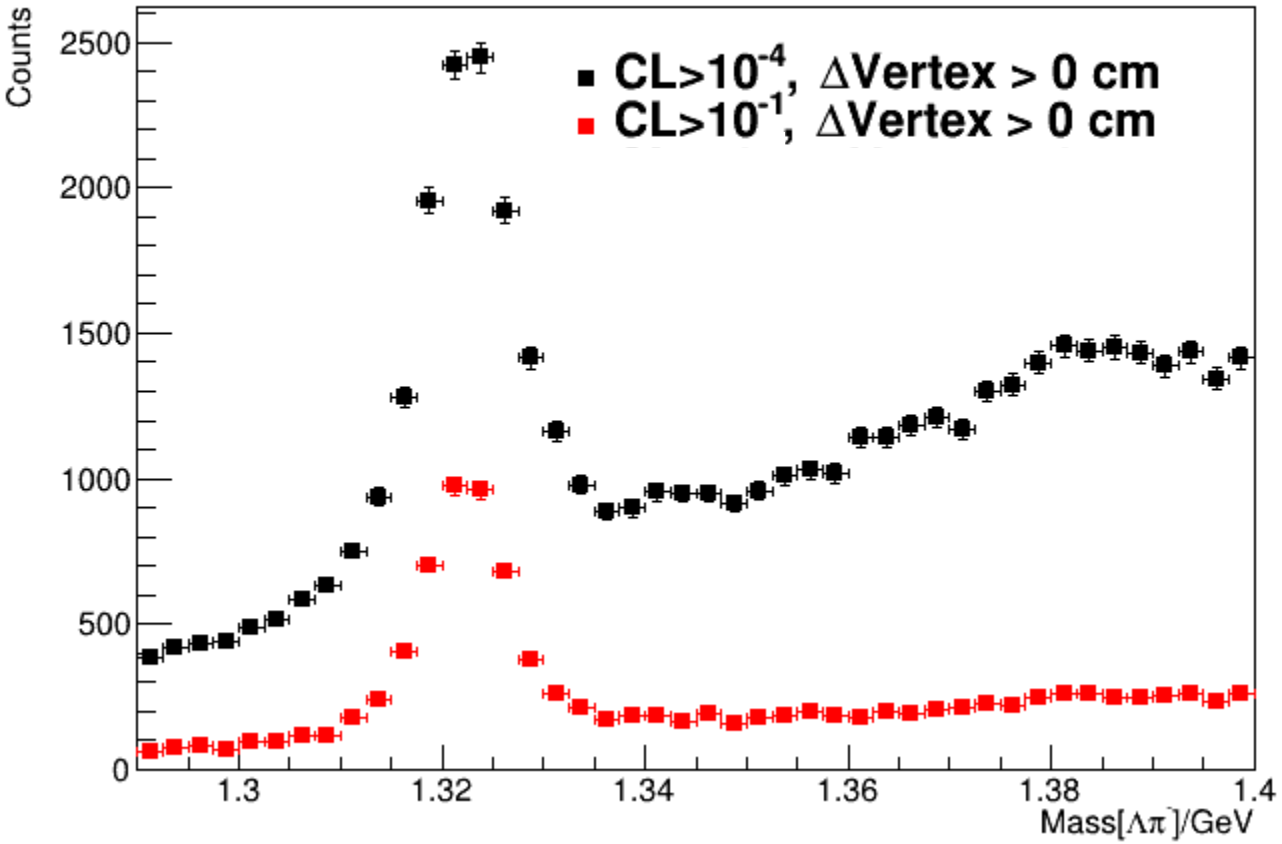
1.69 ±0.07	794	HUBBARD	64	HBC	
$1.86\ ^{+0.15}_{-0.14}$	517	JAUNEAU	63D	FBC	

ΔVertex cut

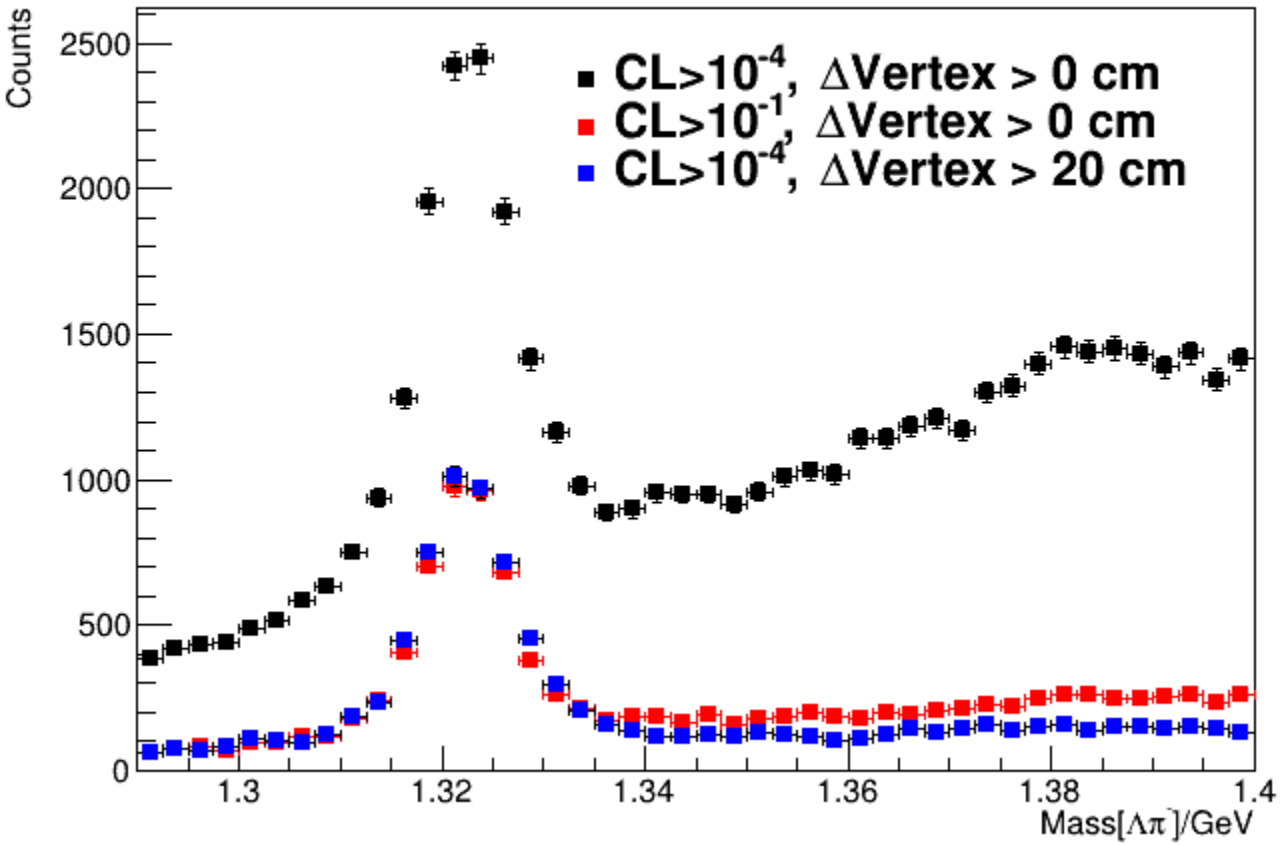
ΔVertex cut


Counts
2500
2000
1500
1000
500
0
1.3
1.32
1.34
1.36
1.38
1.4
Mass[Λπ⁻]/GeV
CL>10⁻⁴, ΔVertex > 0 cm

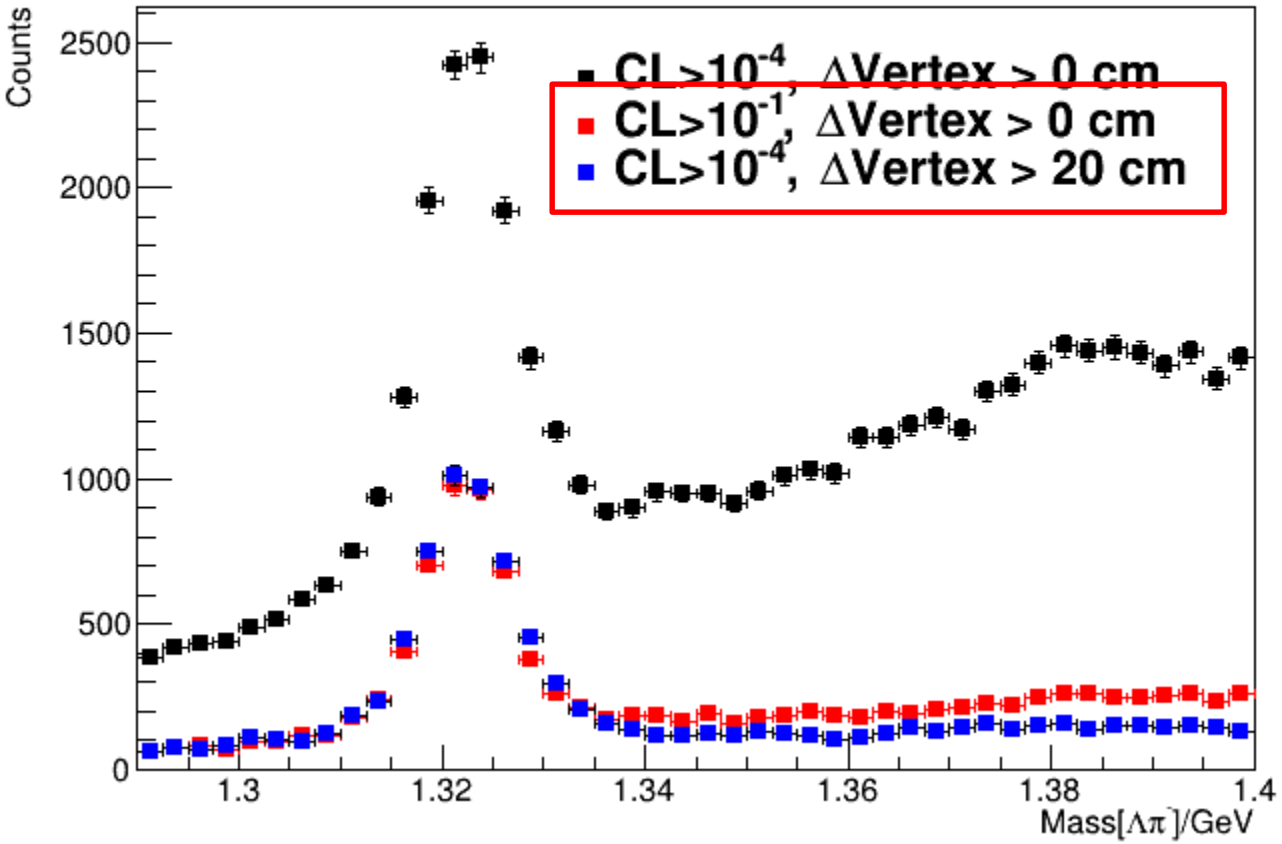
ΔVertex cut


Counts
2500
2000
1500
1000
500
0
1.3
1.32
1.34
1.36
1.38
1.4
Mass[Λπ⁻]/GeV
CL>10⁻⁴, ΔVertex > 0 cm
CL>10⁻¹, ΔVertex > 0 cm

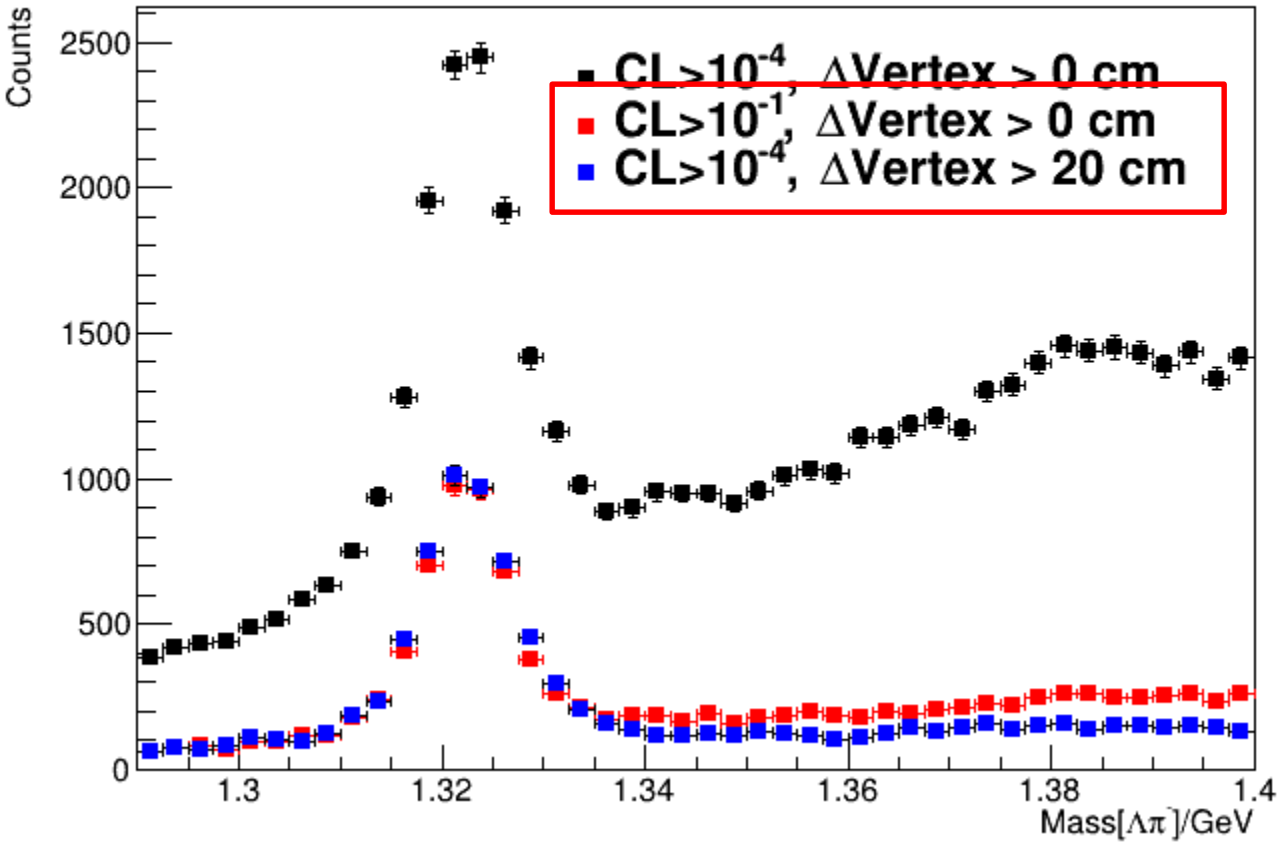
ΔVertex cut


Counts
2500
2000
1500
1000
500
0
1.3
1.32
1.34
1.36
1.38
1.4
Mass[Λπ⁻]/GeV
CL>10⁻⁴, ΔVertex > 0 cm
CL>10⁻¹, ΔVertex > 0 cm
CL>10⁻⁴, ΔVertex > 20 cm

ΔVertex cut

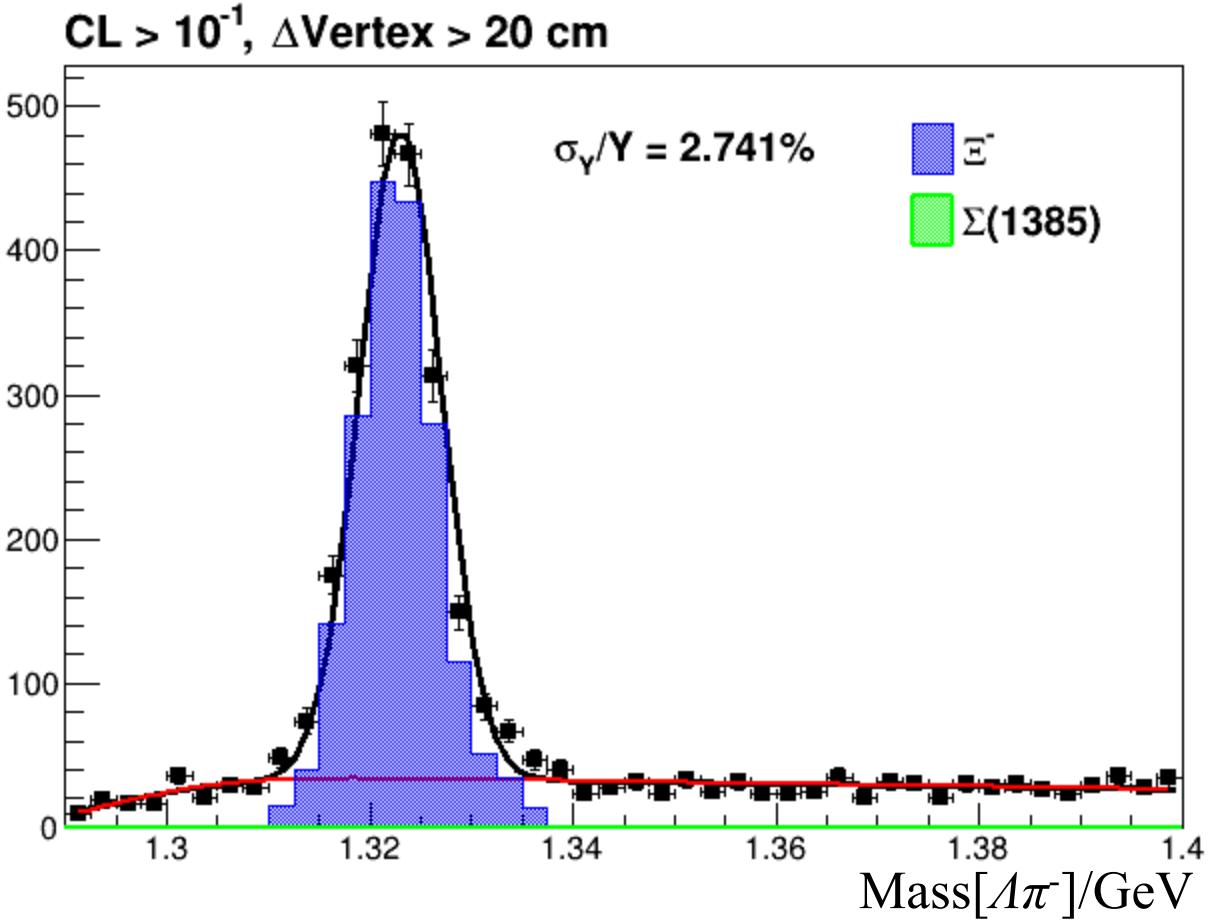

Counts
2500
2000
1500
1000
500
0
1.3
1.32
1.34
1.36
1.38
1.4
Mass[Λπ⁻]/GeV
CL>10⁻⁴, ΔVertex > 0 cm
CL>10⁻¹, ΔVertex > 0 cm
CL>10⁻⁴, ΔVertex > 20 cm

ΔVertex cut

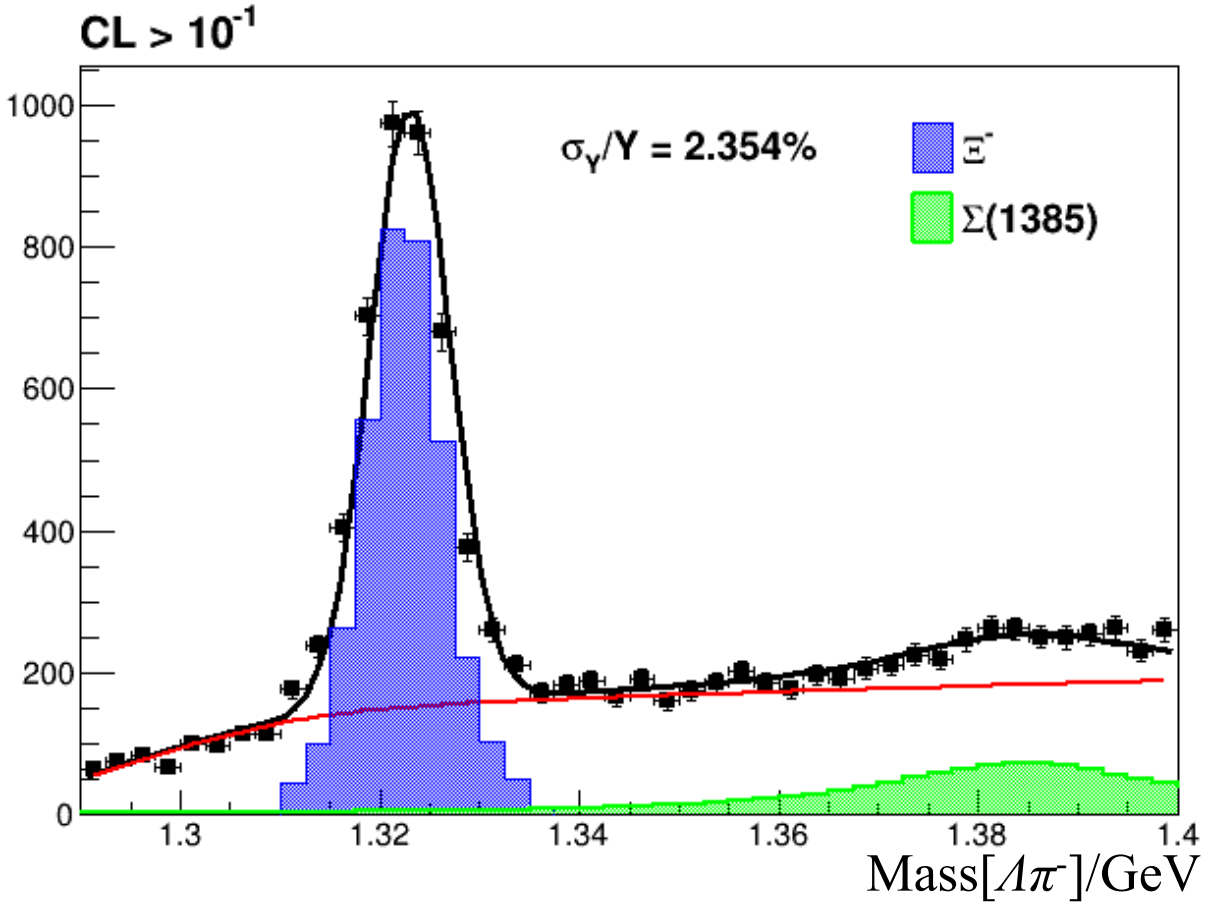


- Different combinations of CL and ΔVertex cuts can yield very similar results

ΔVertex cut

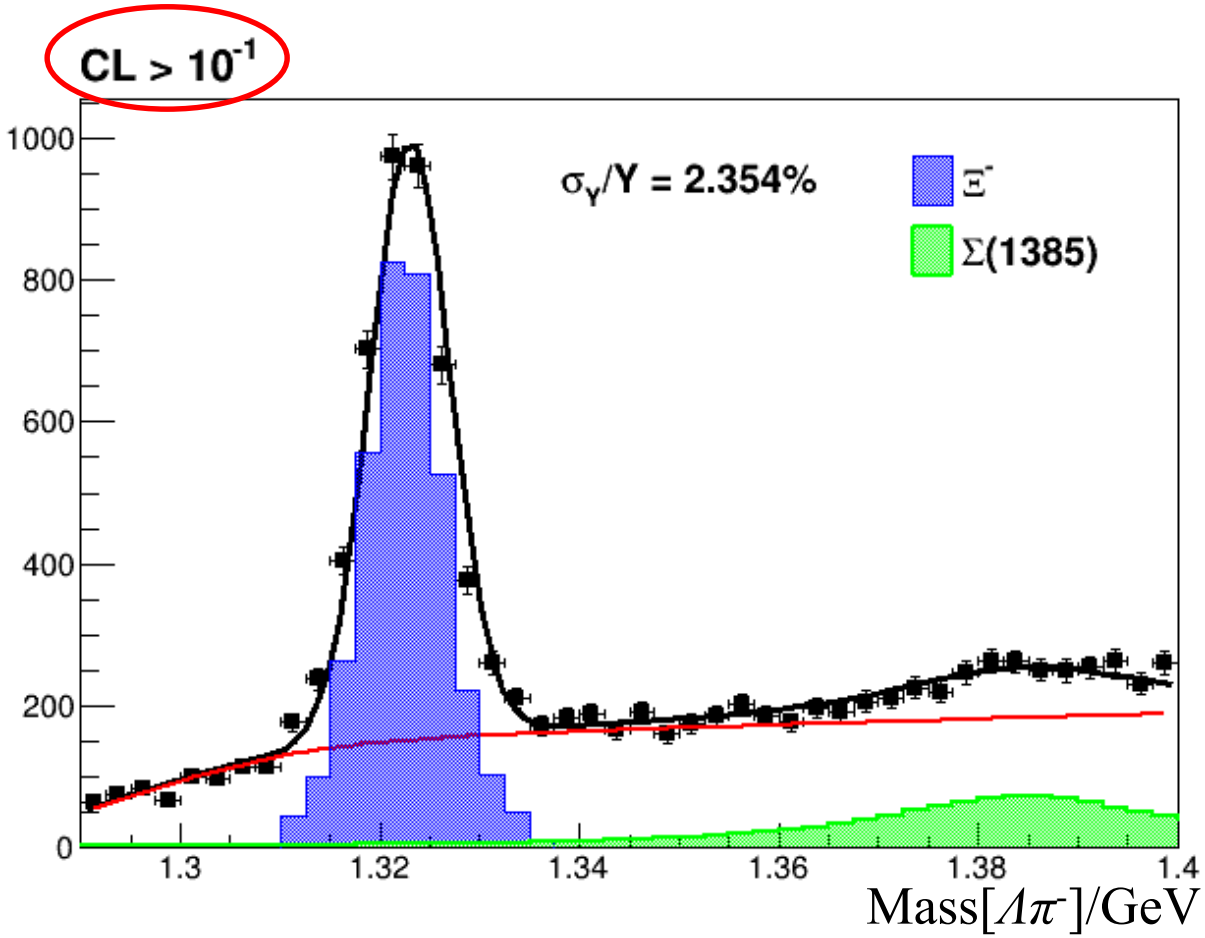


- With vertex cut, the Ξ signal can become very clean!
- Need to study different vertex cuts with different CL cuts



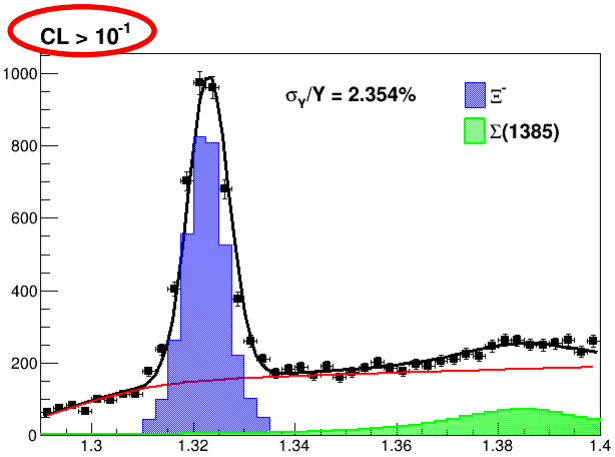
No vertex cut

- Yield extraction: +/- 3σ of Ξ^- peak

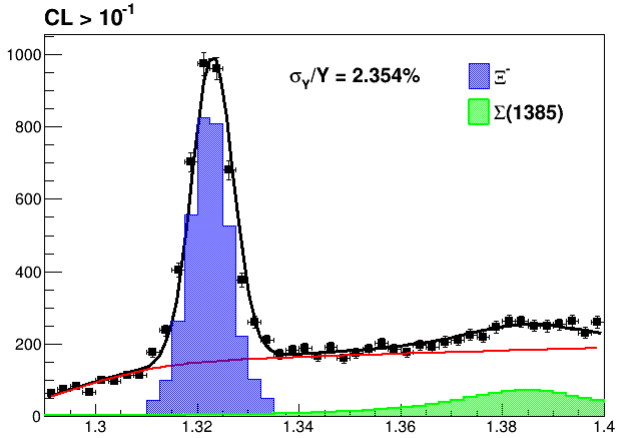


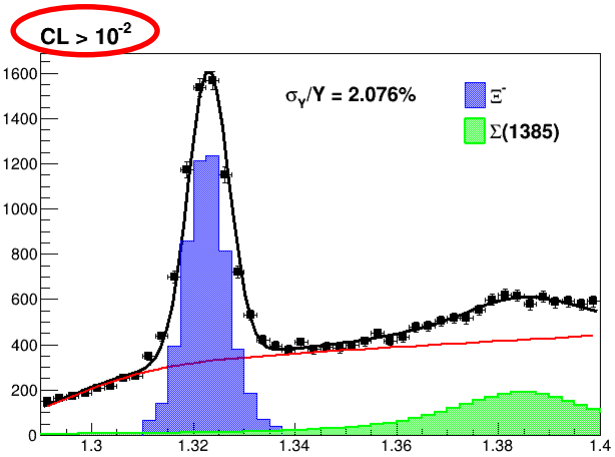
No vertex cut

- Yield extraction: +/- 3σ of Ξ^- peak

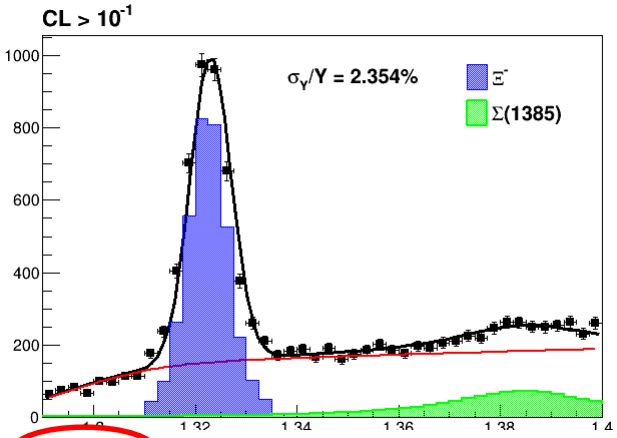


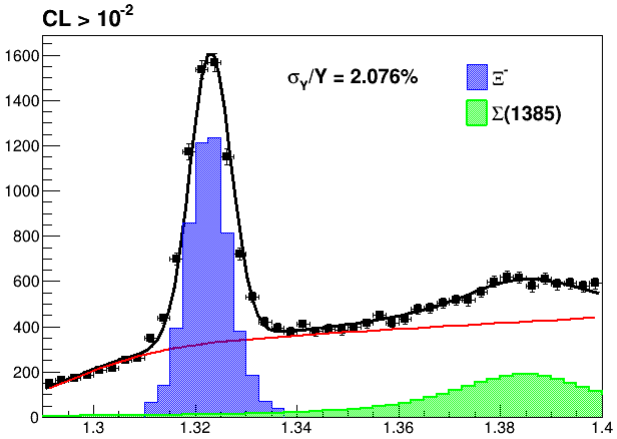
No vertex cut

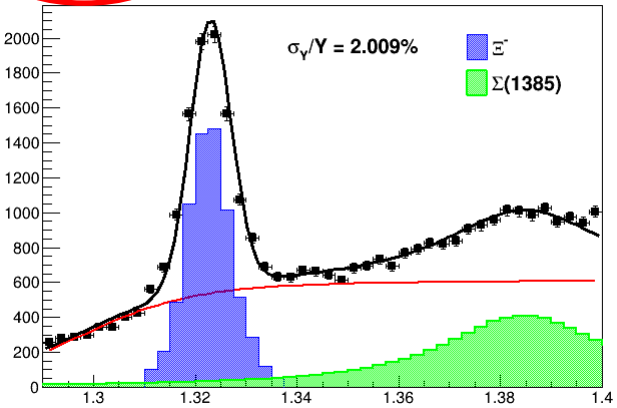




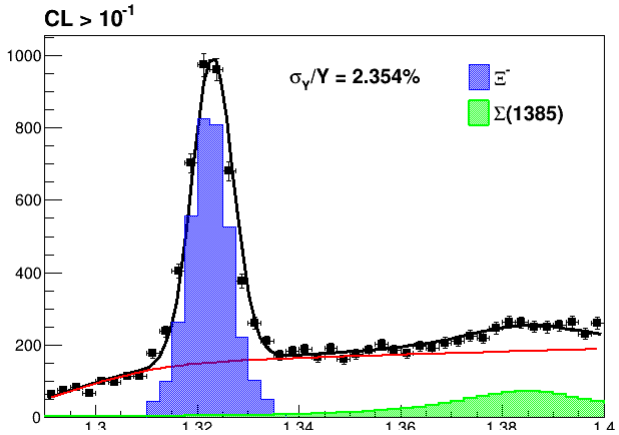
No vertex cut

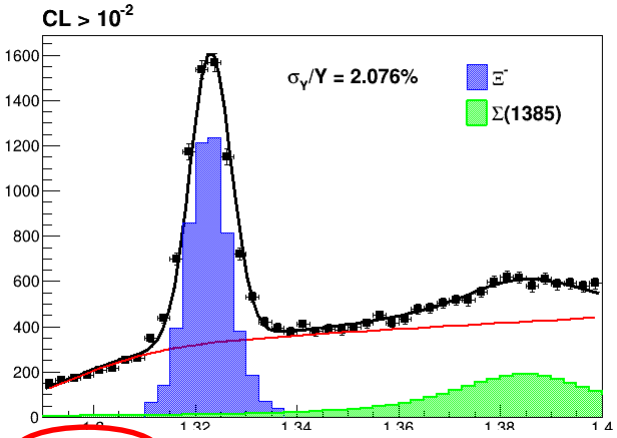


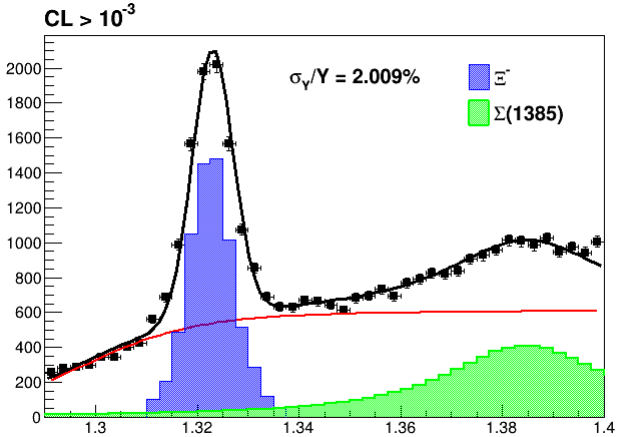


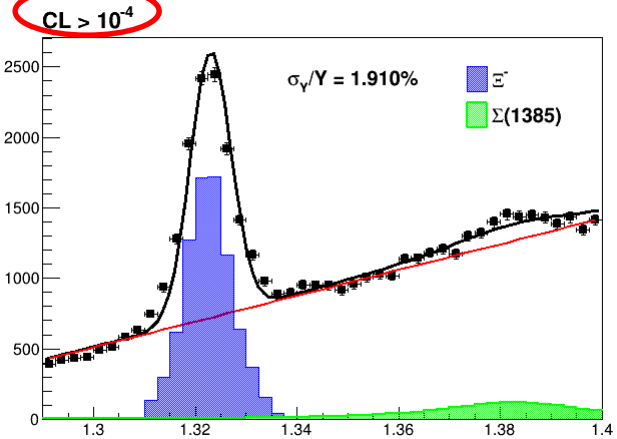


No vertex cut

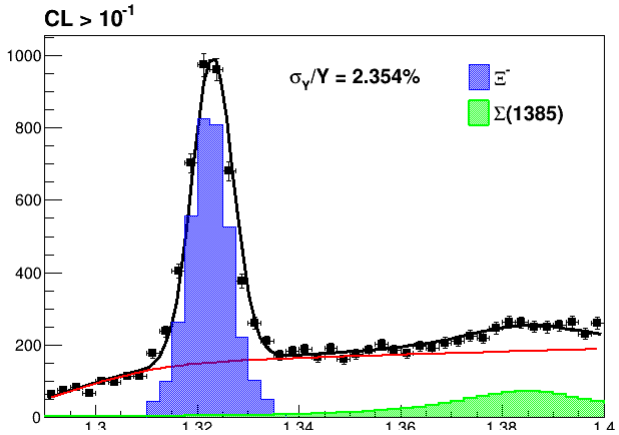


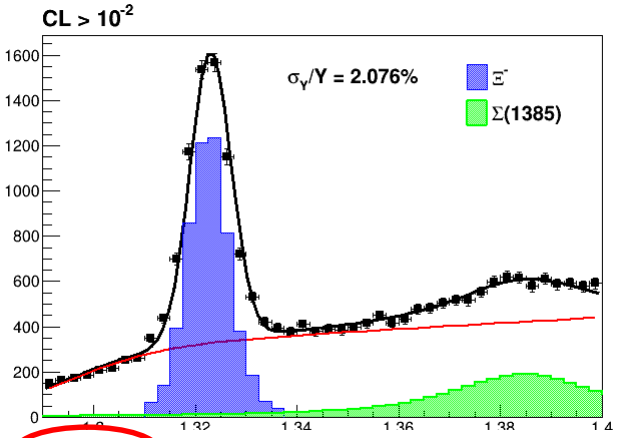


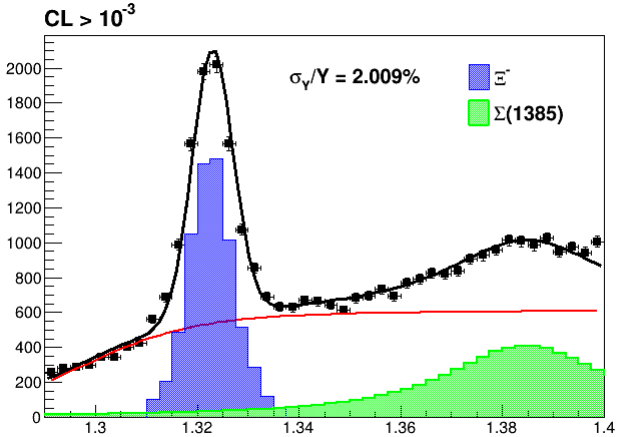


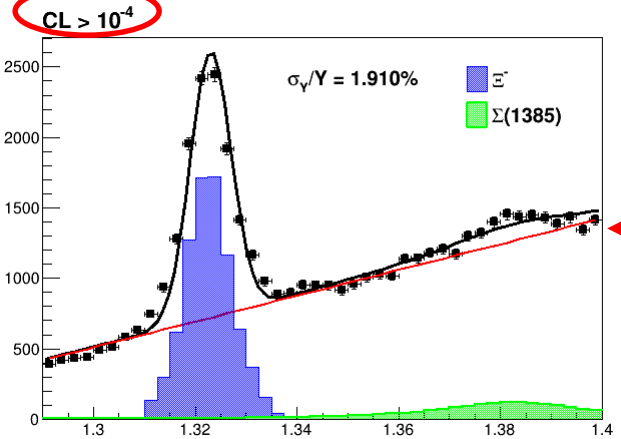


No vertex cut



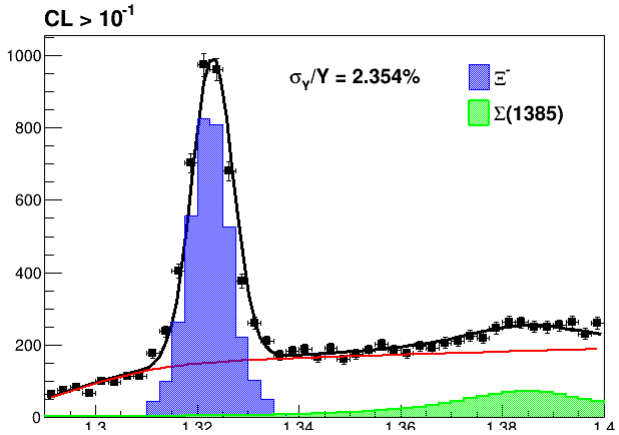


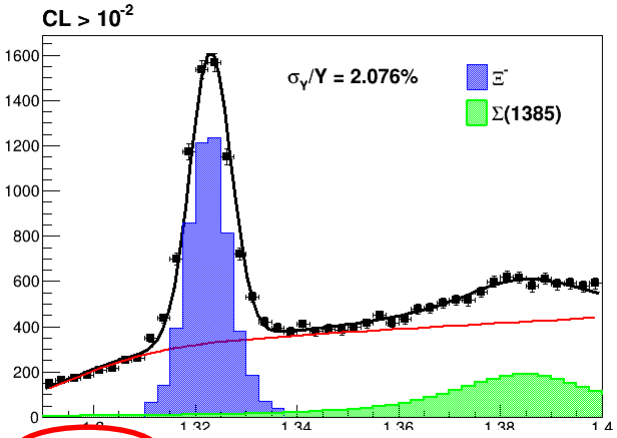


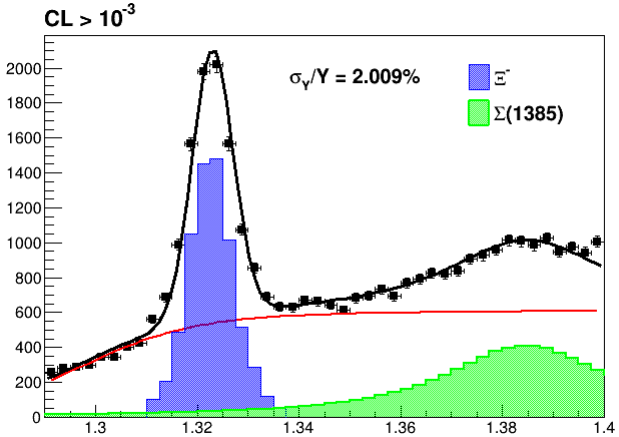


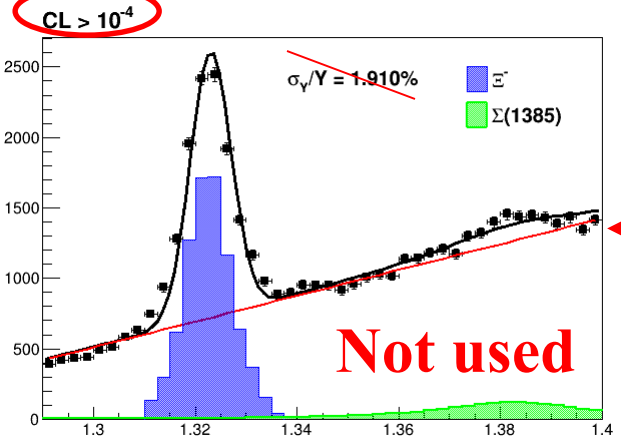
No vertex cut

Fit does not look like the others



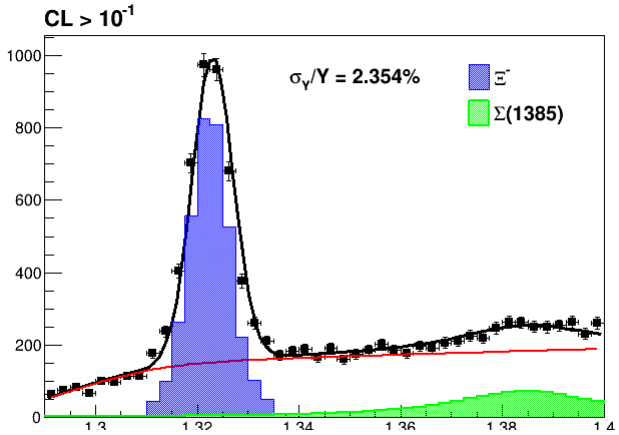


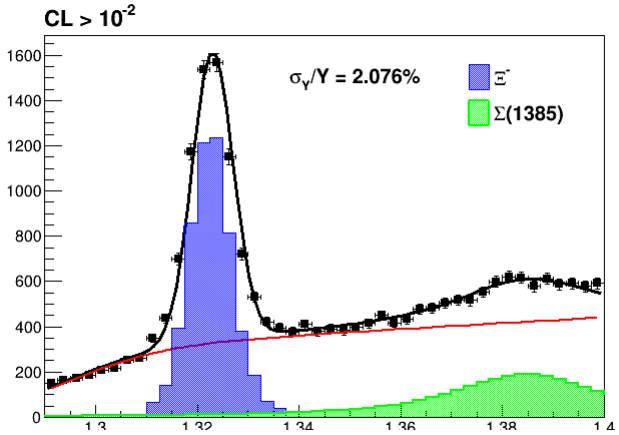


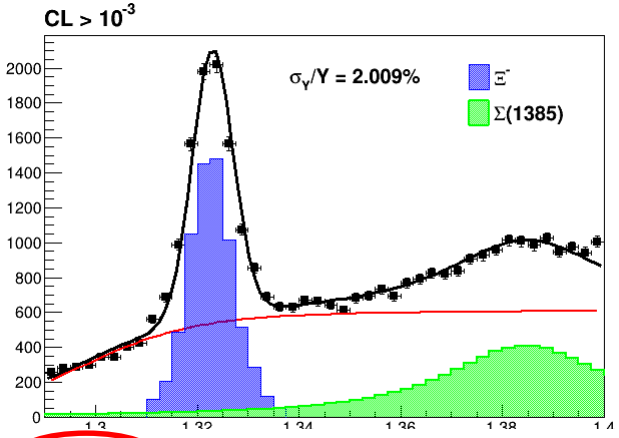


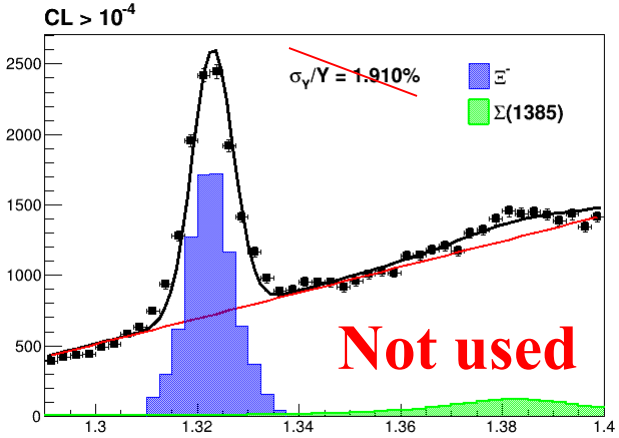
No vertex cut

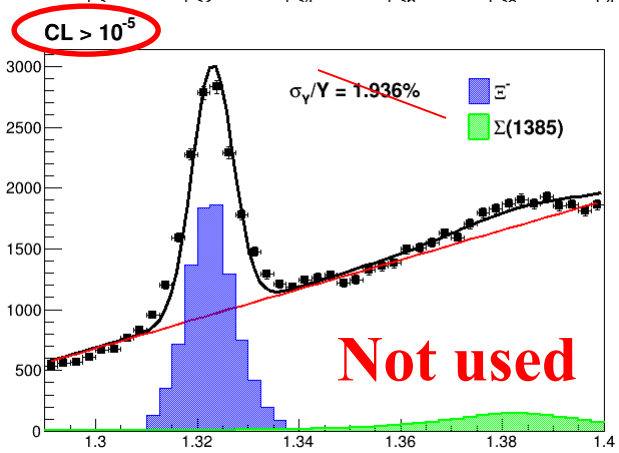
Fit does not look like the others



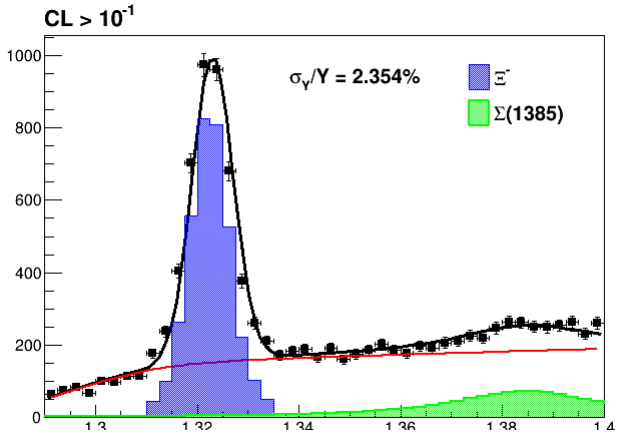


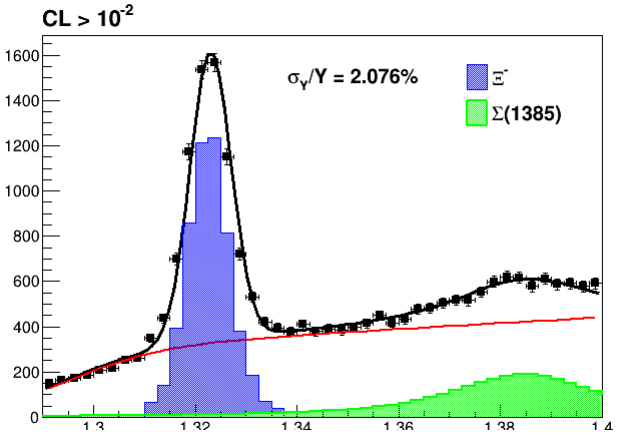


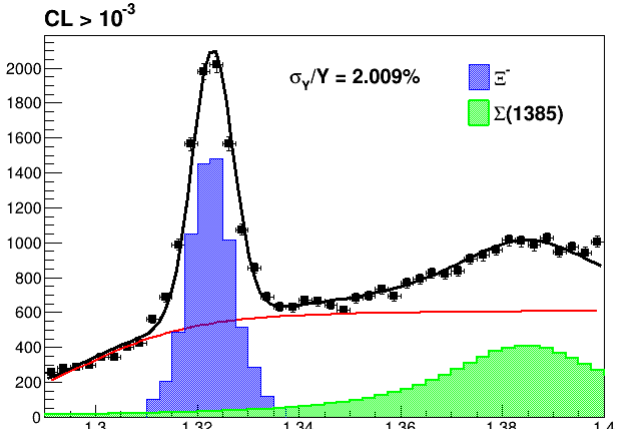


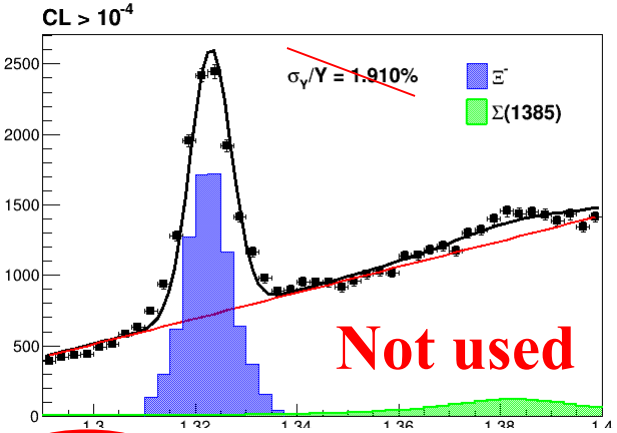


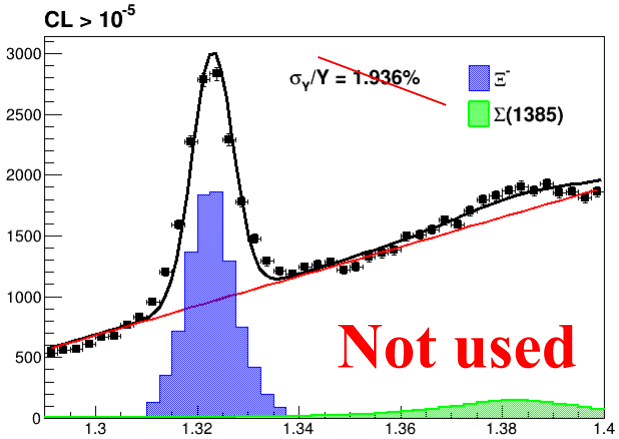
No vertex cut

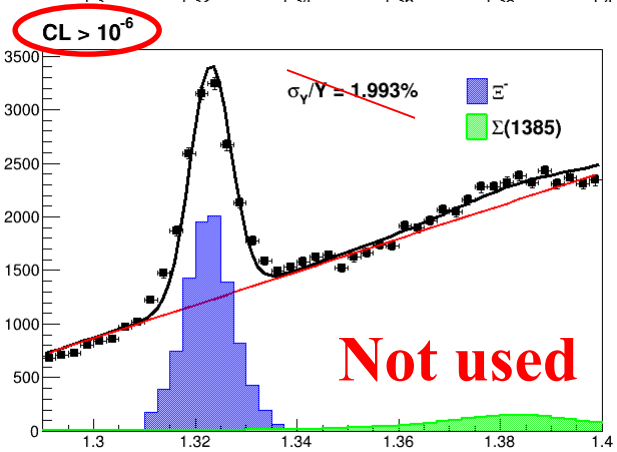




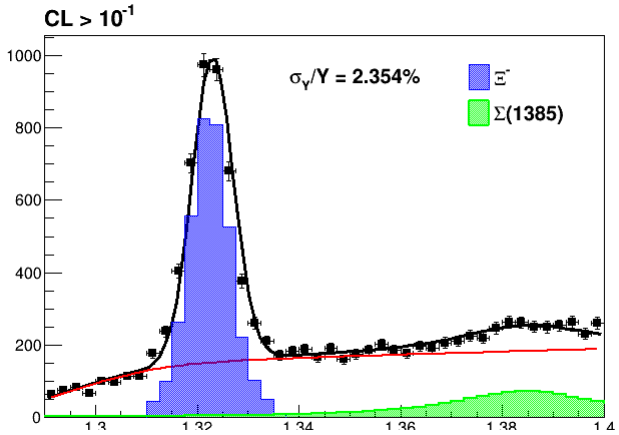


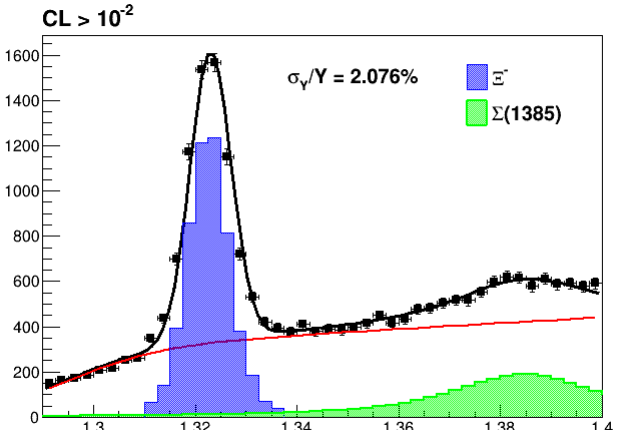


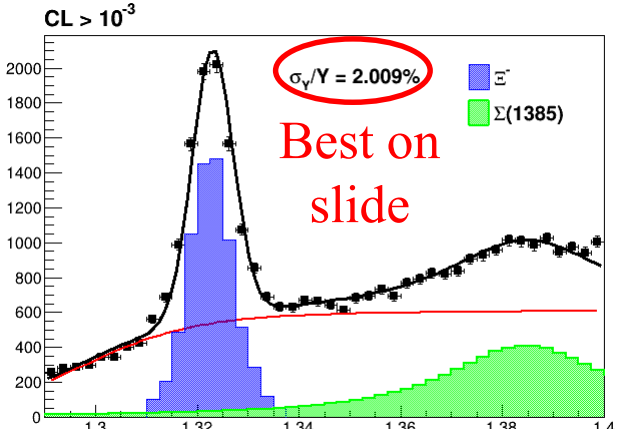


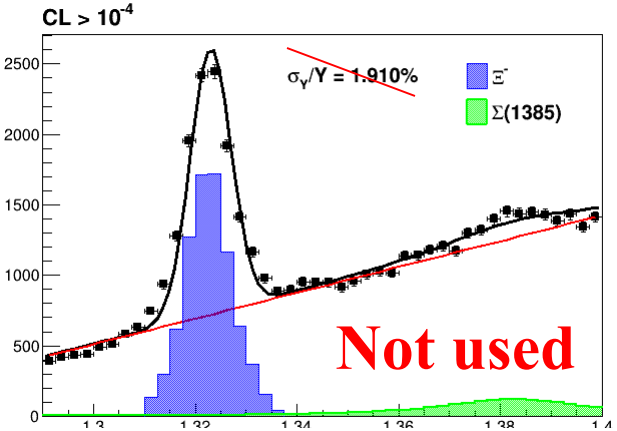


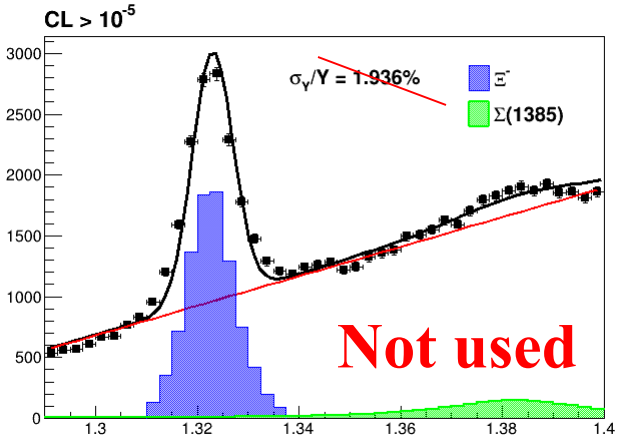
No vertex cut

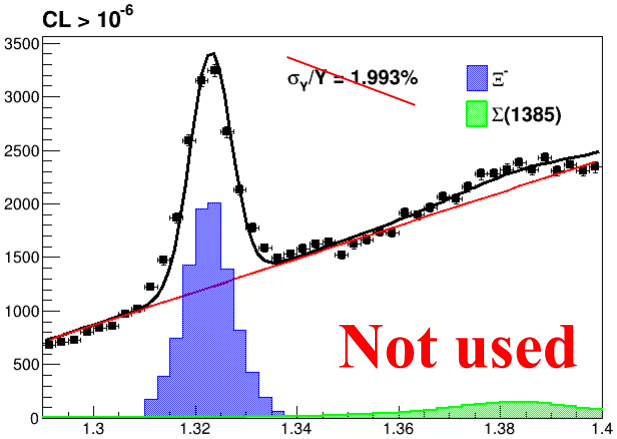




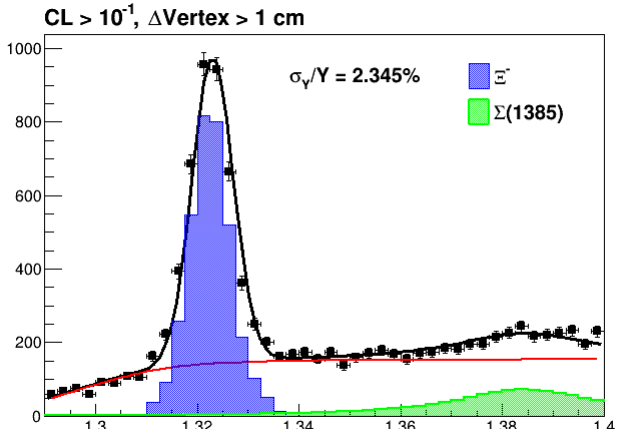


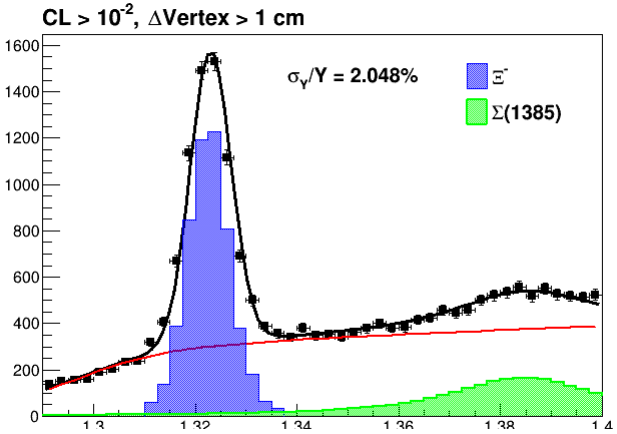




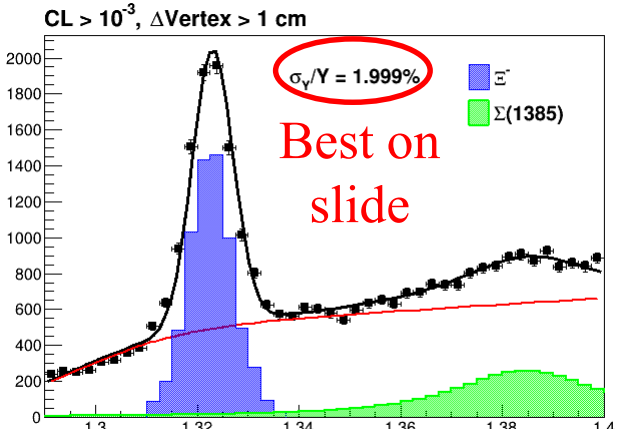


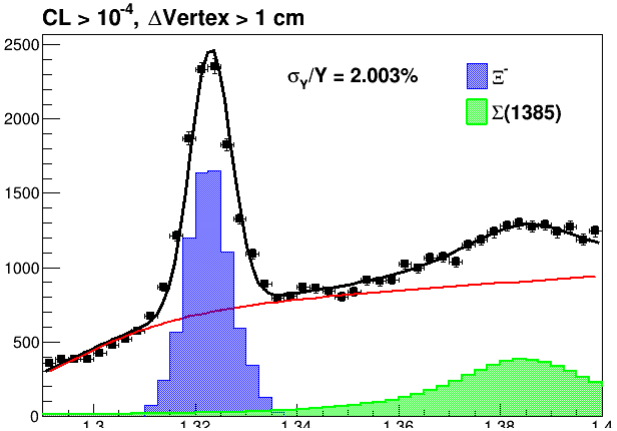
No vertex cut

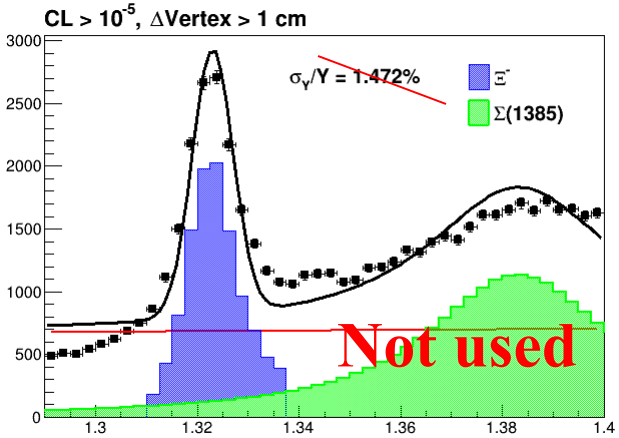

CL > 10^-1, ΔVertex > 1 cm
σY/Y = 2.345%
Ξ-
Σ(1385)

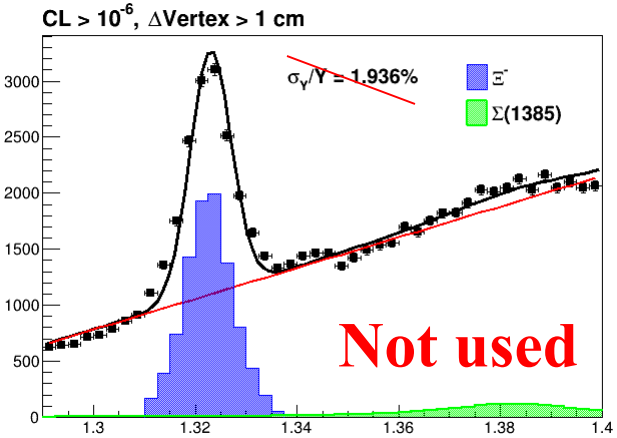

CL > 10^-2, ΔVertex > 1 cm
σY/Y = 2.048%
Ξ-
Σ(1385)

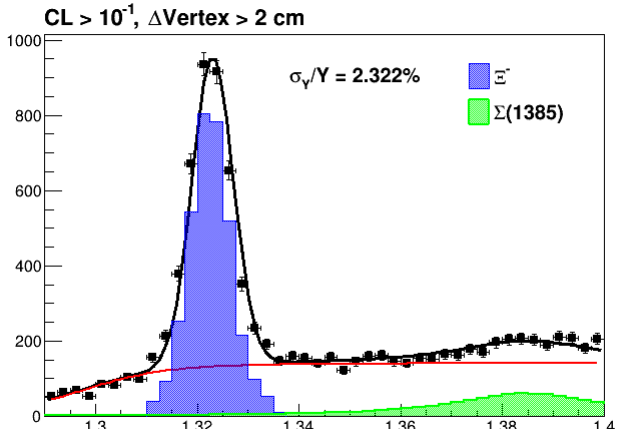
Δvertex > 1 cm

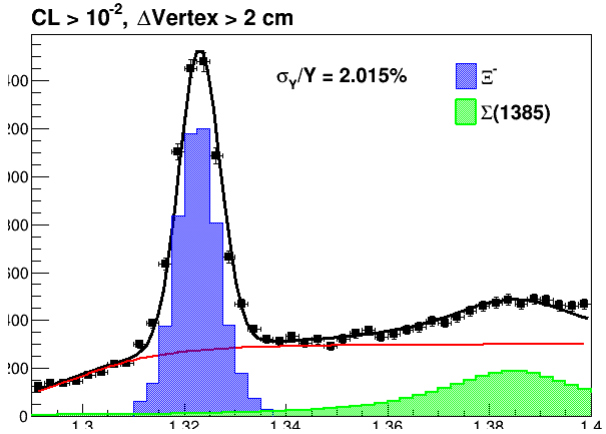

CL > 10^-3, ΔVertex > 1 cm
σY/Y = 1.999%
Ξ-
Σ(1385)
Best on slide


CL > 10^-4, ΔVertex > 1 cm
σY/Y = 2.003%
Ξ-
Σ(1385)

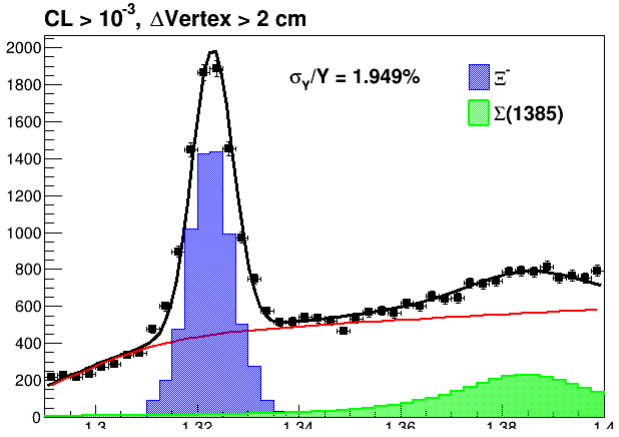

CL > 10^-5, ΔVertex > 1 cm
σY/Y = 1.472%
Ξ-
Σ(1385)
Not used

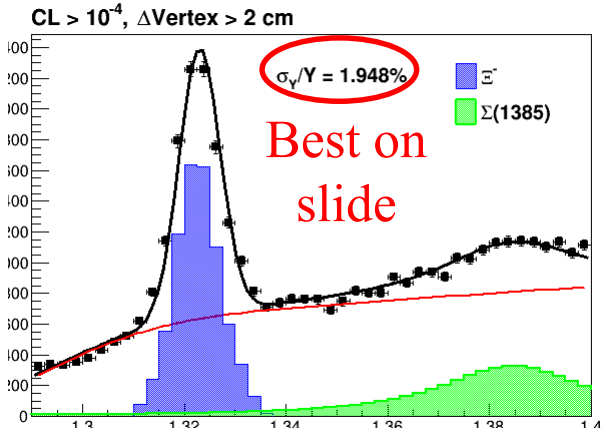

CL > 10^-6, ΔVertex > 1 cm
σY/Y = 1.936%
Ξ-
Σ(1385)
Not used

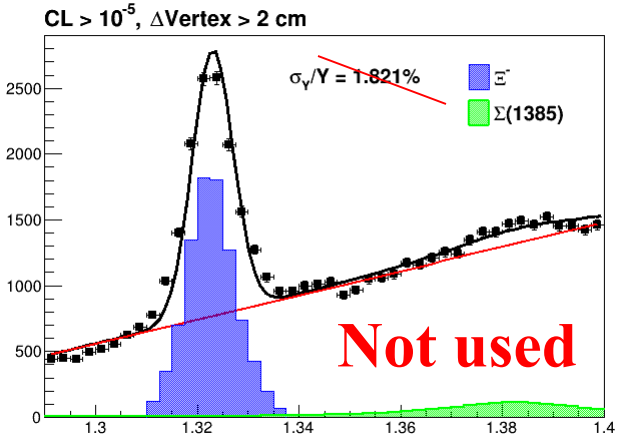

CL > 10^-1, ΔVertex > 2 cm
σ_Y/Y = 2.322%
Ξ⁻
Σ(1385)

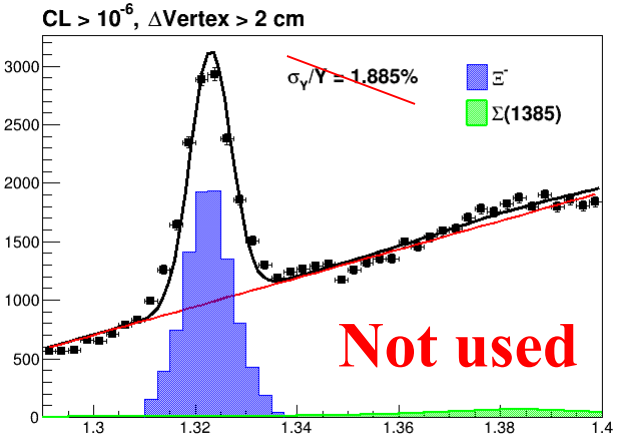

CL > 10^-2, ΔVertex > 2 cm
σ_Y/Y = 2.015%
Ξ⁻
Σ(1385)

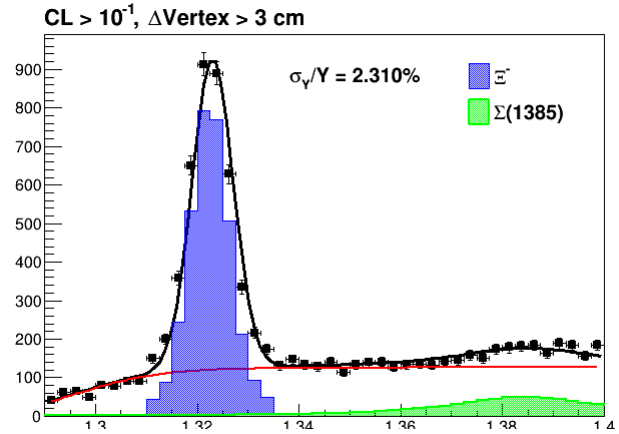
Δvertex > 2 cm

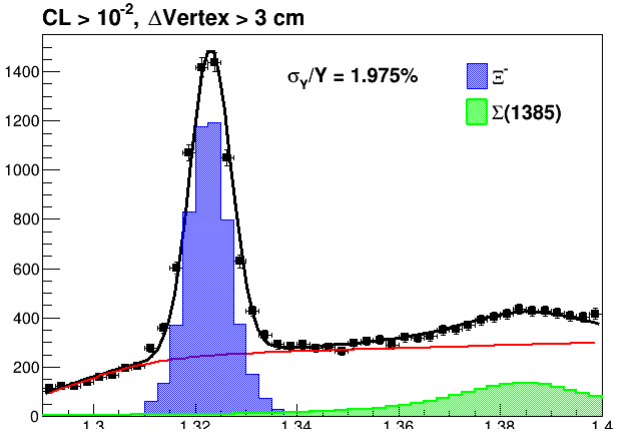

CL > 10^-3, ΔVertex > 2 cm
σ_Y/Y = 1.949%
Ξ⁻
Σ(1385)


CL > 10^-4, ΔVertex > 2 cm
σ_Y/Y = 1.948%
Ξ⁻
Σ(1385)
Best on slide

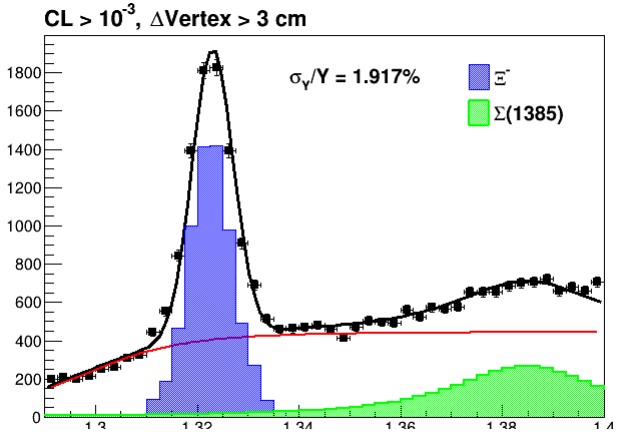

CL > 10^-5, ΔVertex > 2 cm
σ_Y/Y = 1.821%
Ξ⁻
Σ(1385)
Not used

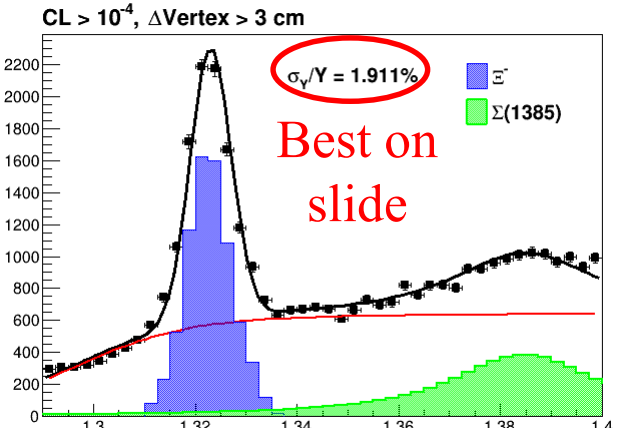

CL > 10^-6, ΔVertex > 2 cm
σ_Y/Y = 1.885%
Ξ⁻
Σ(1385)
Not used

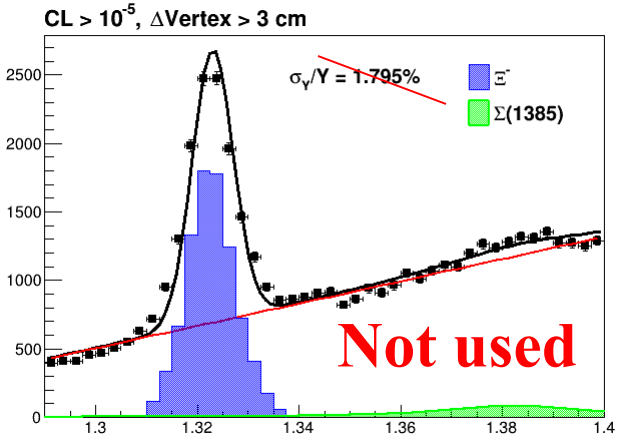

CL > 10^-1, ΔVertex > 3 cm
σY/Y = 2.310%
Ξ-
Σ(1385)

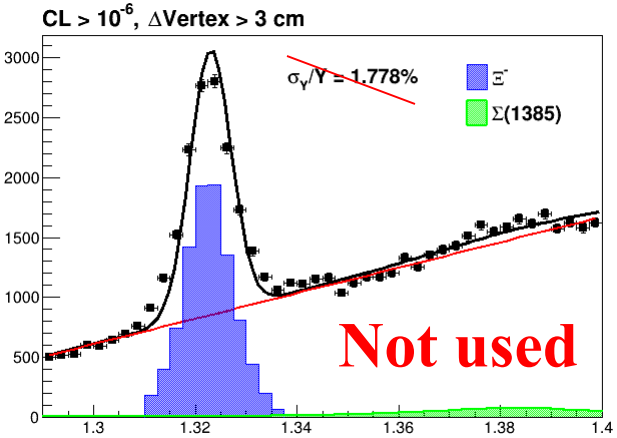

CL > 10^-2, ΔVertex > 3 cm
σY/Y = 1.975%
Ξ-
Σ(1385)

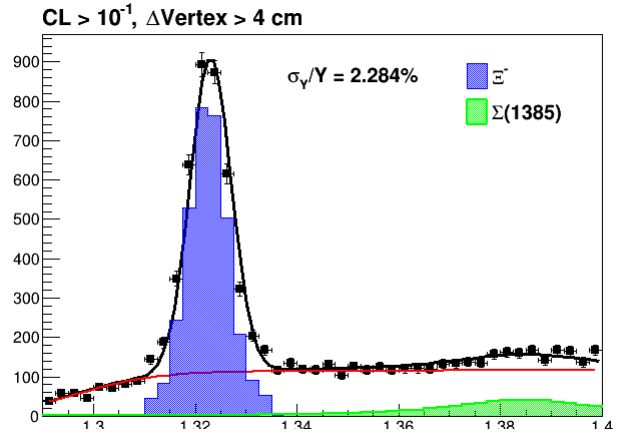
Δvertex > 3 cm

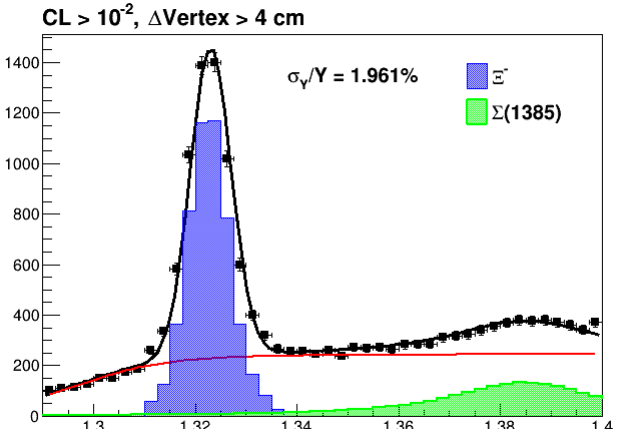

CL > 10^-3, ΔVertex > 3 cm
σY/Y = 1.917%
Ξ-
Σ(1385)


CL > 10^-4, ΔVertex > 3 cm
σY/Y = 1.911%
Ξ-
Σ(1385)
Best on slide

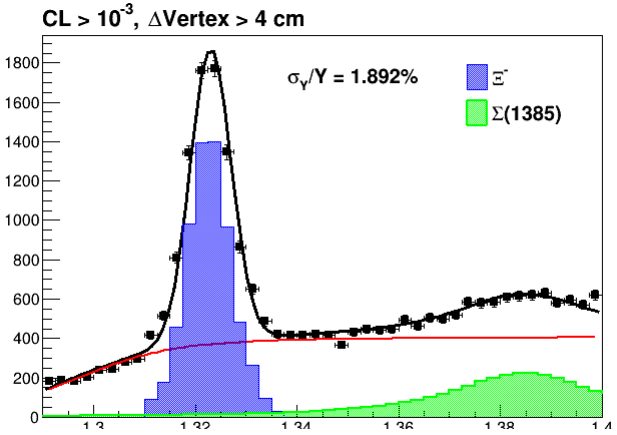

CL > 10^-5, ΔVertex > 3 cm
σY/Y = 1.795%
Ξ-
Σ(1385)
Not used

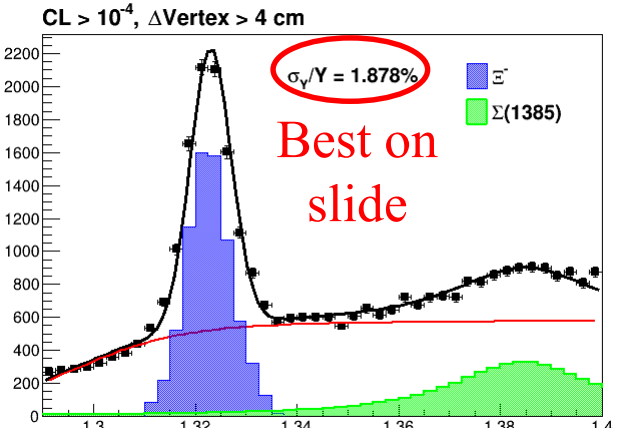

CL > 10^-6, ΔVertex > 3 cm
σY/Y = 1.778%
Ξ-
Σ(1385)
Not used

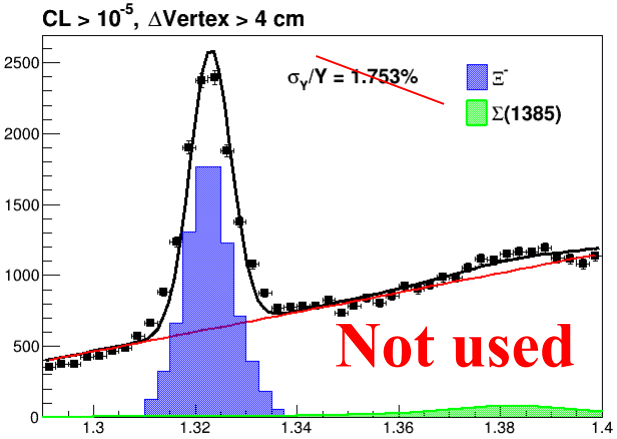

CL > 10^-1, ΔVertex > 4 cm
σY/Y = 2.284%
Ξ-
Σ(1385)

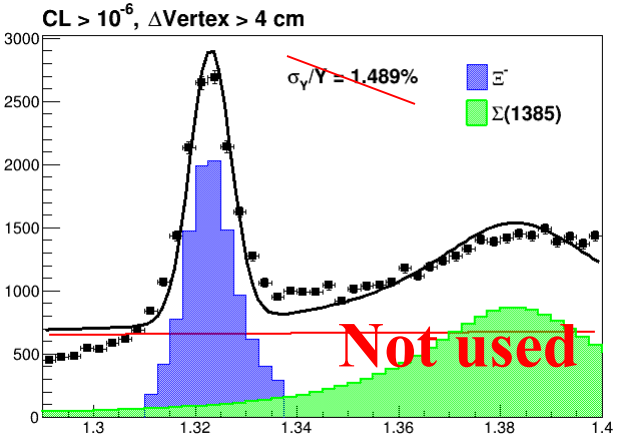

CL > 10^-2, ΔVertex > 4 cm
σY/Y = 1.961%
Ξ-
Σ(1385)

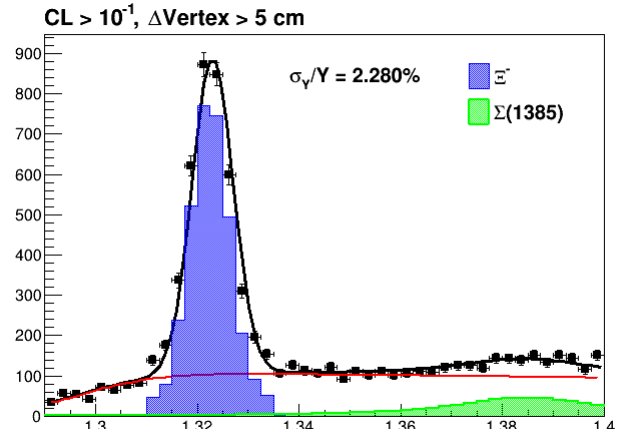
Δvertex > 4 cm

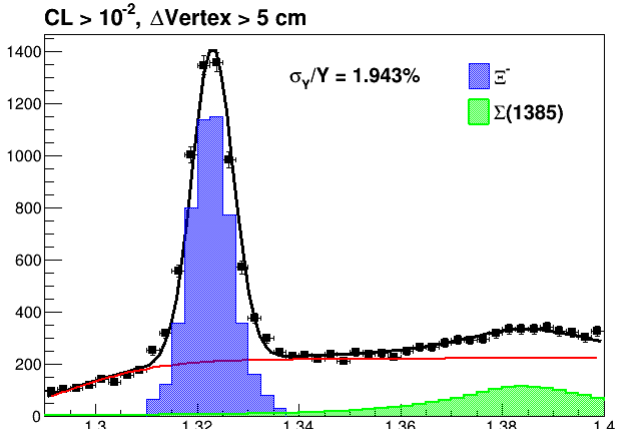

CL > 10^-3, ΔVertex > 4 cm
σY/Y = 1.892%
Ξ-
Σ(1385)


CL > 10^-4, ΔVertex > 4 cm
σY/Y = 1.878%
Ξ-
Σ(1385)
Best on slide

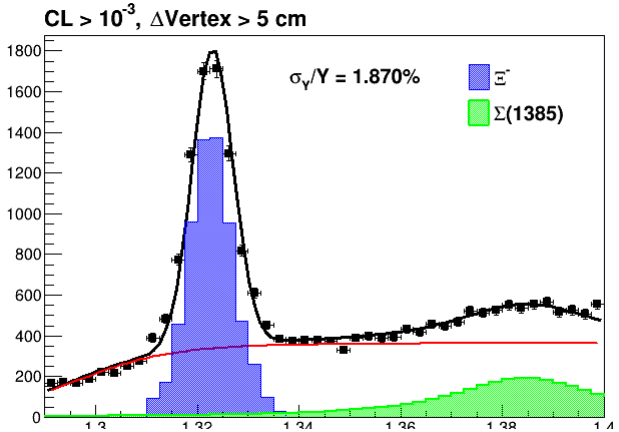

CL > 10^-5, ΔVertex > 4 cm
σY/Y = 1.753%
Ξ-
Σ(1385)
Not used

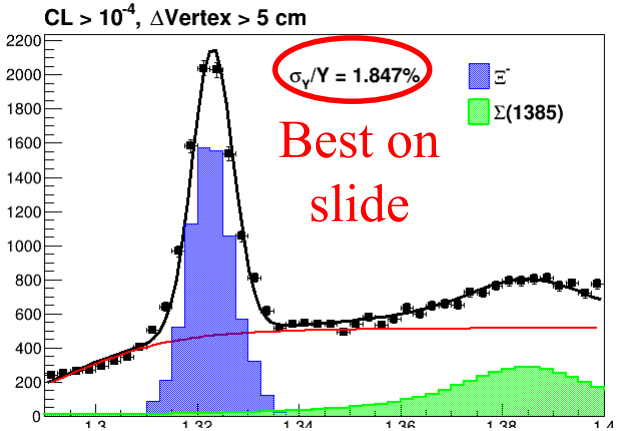

CL > 10^-6, ΔVertex > 4 cm
σY/Y = 1.489%
Ξ-
Σ(1385)
Not used

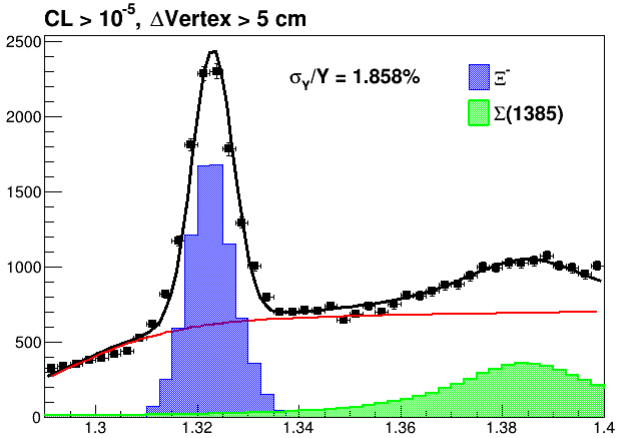

CL > 10^-1, ΔVertex > 5 cm
σ_Y/Y = 2.280%
Ξ⁻
Σ(1385)

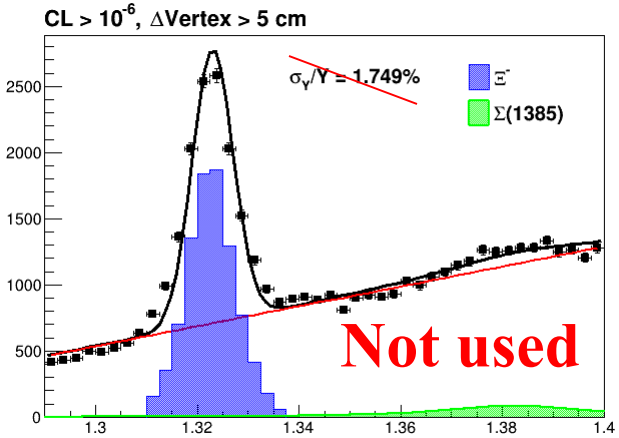

CL > 10^-2, ΔVertex > 5 cm
σ_Y/Y = 1.943%
Ξ⁻
Σ(1385)

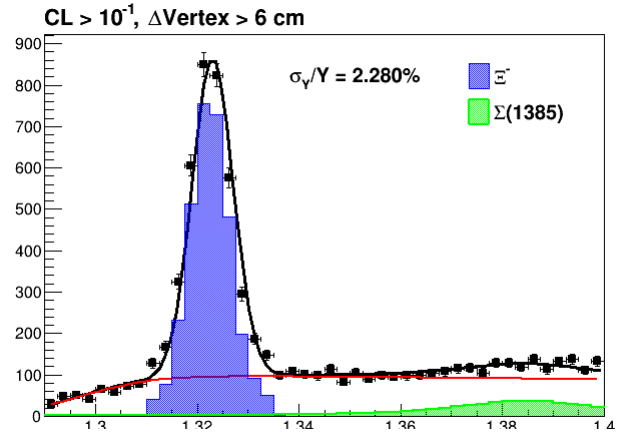
Δvertex > 5 cm

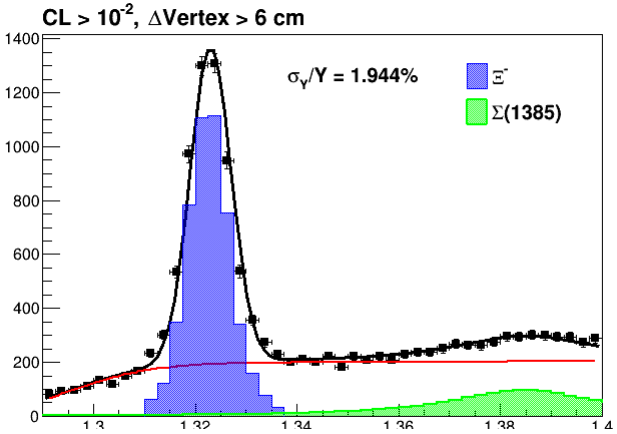

CL > 10^-3, ΔVertex > 5 cm
σ_Y/Y = 1.870%
Ξ⁻
Σ(1385)


CL > 10^-4, ΔVertex > 5 cm
σ_Y/Y = 1.847%
Ξ⁻
Σ(1385)
Best on slide

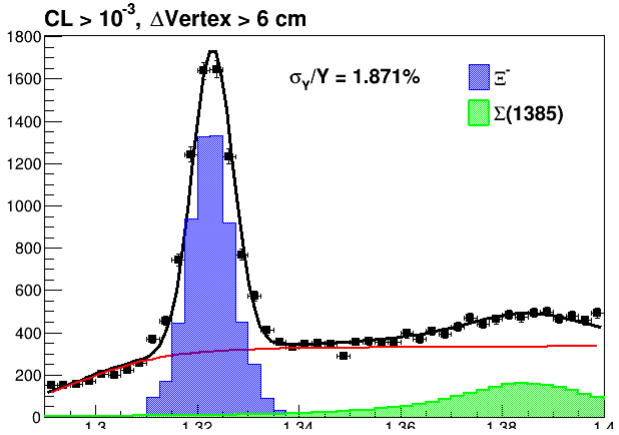

CL > 10^-5, ΔVertex > 5 cm
σ_Y/Y = 1.858%
Ξ⁻
Σ(1385)

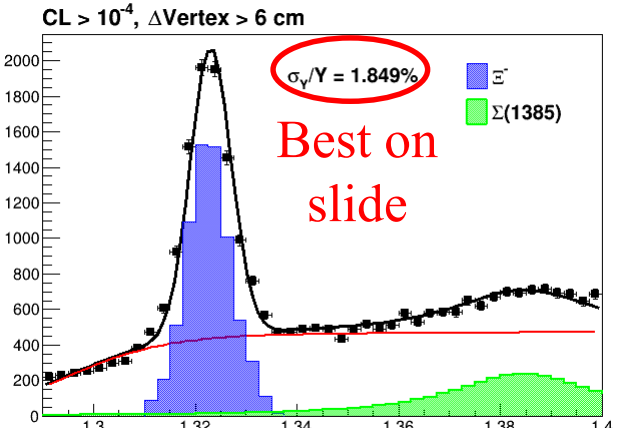

CL > 10^-6, ΔVertex > 5 cm
σ_Y/Y = 1.749%
Ξ⁻
Σ(1385)
Not used

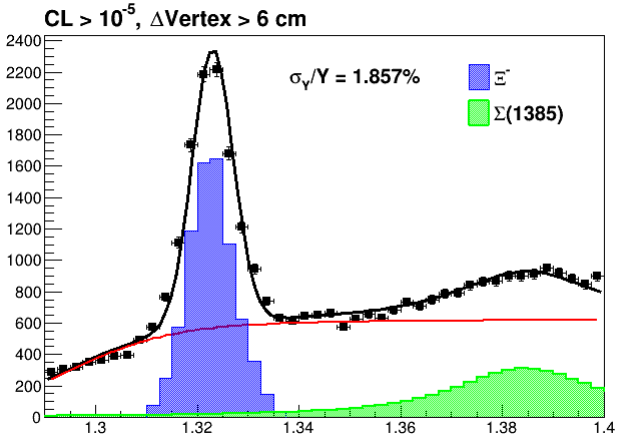

CL > 10^-1, ΔVertex > 6 cm
σY/Y = 2.280%
Ξ-
Σ(1385)

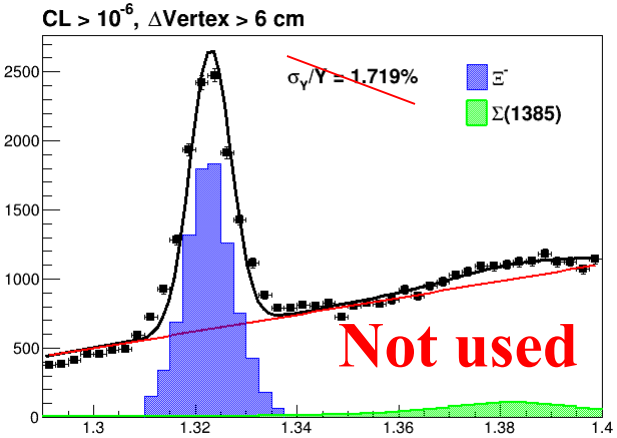

CL > 10^-2, ΔVertex > 6 cm
σY/Y = 1.944%
Ξ-
Σ(1385)

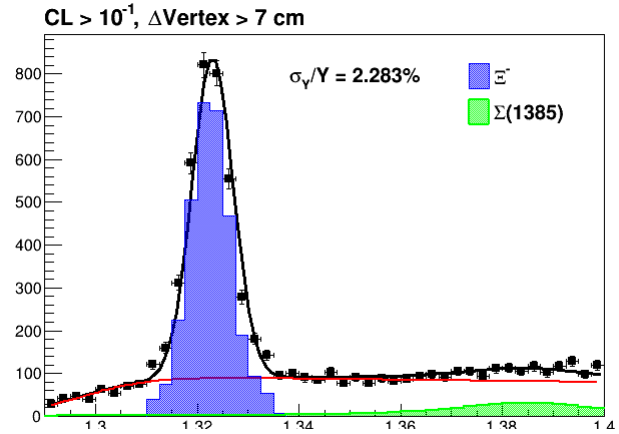
Δvertex > 6 cm

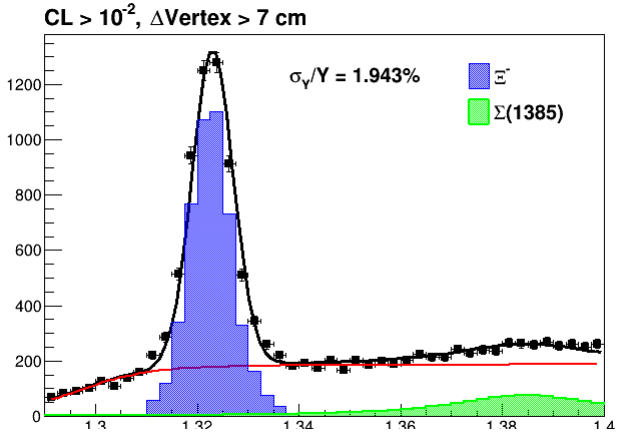

CL > 10^-3, ΔVertex > 6 cm
σY/Y = 1.871%
Ξ-
Σ(1385)


CL > 10^-4, ΔVertex > 6 cm
σY/Y = 1.849%
Ξ-
Σ(1385)
Best on slide

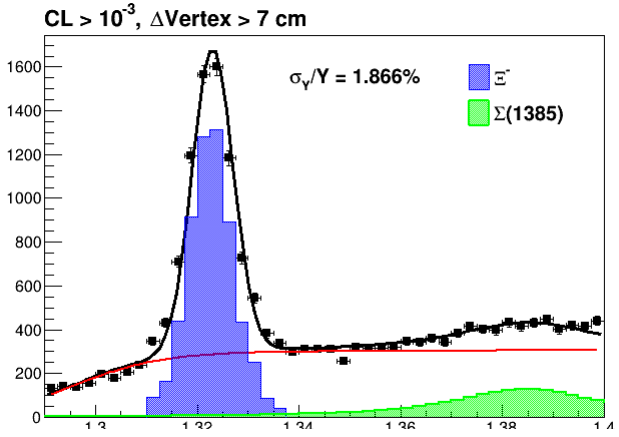

CL > 10^-5, ΔVertex > 6 cm
σY/Y = 1.857%
Ξ-
Σ(1385)

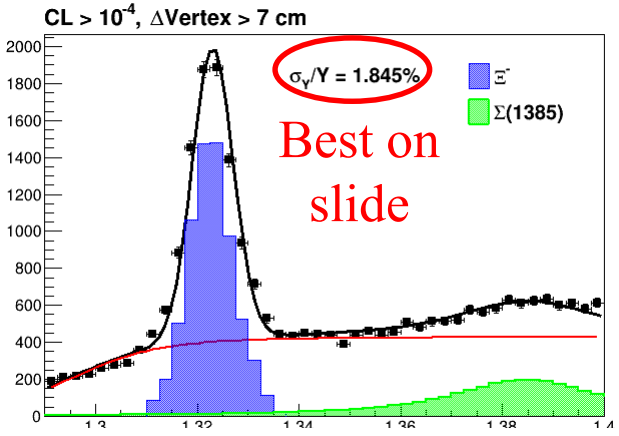

CL > 10^-6, ΔVertex > 6 cm
σY/Y = 1.719%
Ξ-
Σ(1385)
Not used

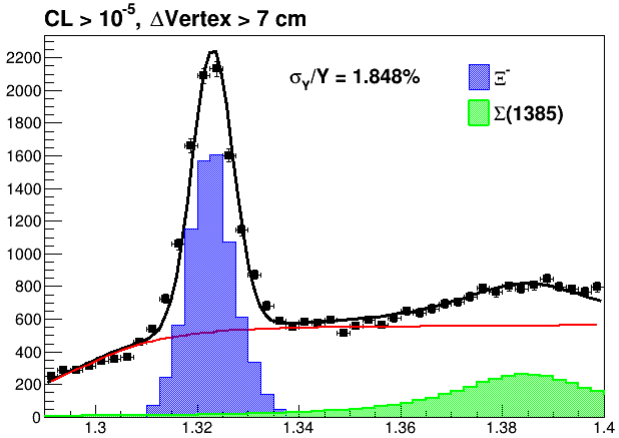

CL > 10^-1, ΔVertex > 7 cm
σ_Y/Y = 2.283%
Ξ⁻
Σ(1385)

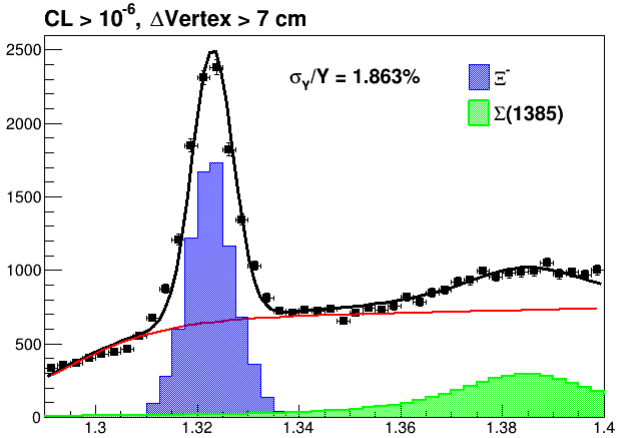

CL > 10^-2, ΔVertex > 7 cm
σ_Y/Y = 1.943%
Ξ⁻
Σ(1385)

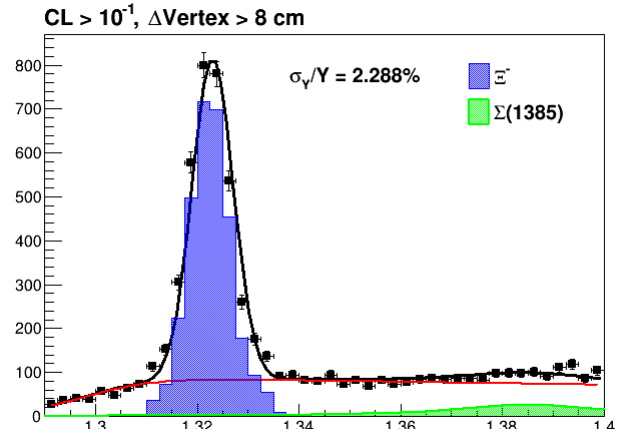
Δvertex > 7 cm

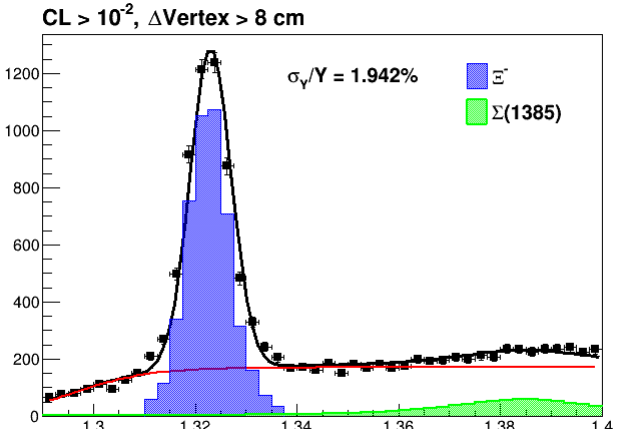

CL > 10^-3, ΔVertex > 7 cm
σ_Y/Y = 1.866%
Ξ⁻
Σ(1385)


CL > 10^-4, ΔVertex > 7 cm
σ_Y/Y = 1.845%
Ξ⁻
Σ(1385)
Best on slide

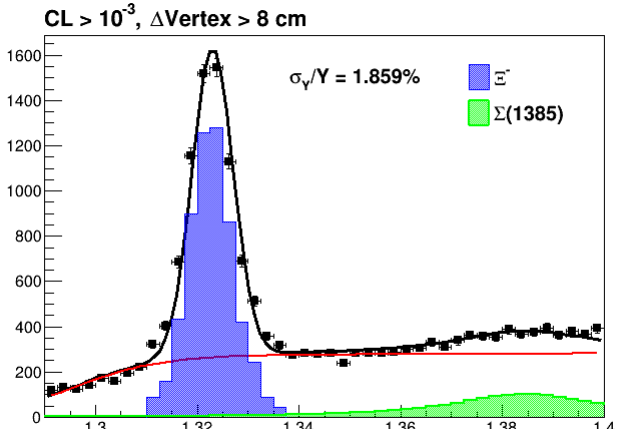

CL > 10^-5, ΔVertex > 7 cm
σ_Y/Y = 1.848%
Ξ⁻
Σ(1385)

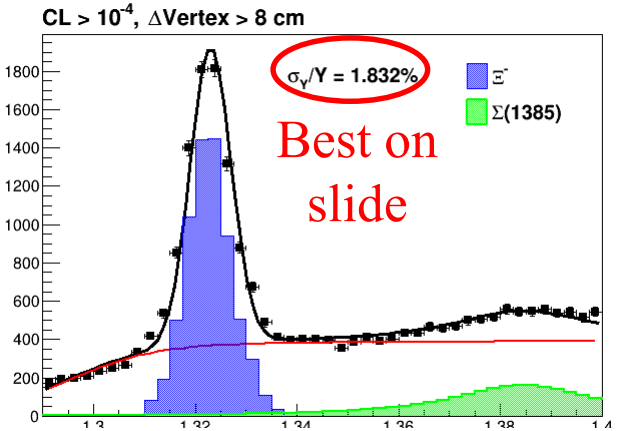

CL > 10^-6, ΔVertex > 7 cm
σ_Y/Y = 1.863%
Ξ⁻
Σ(1385)

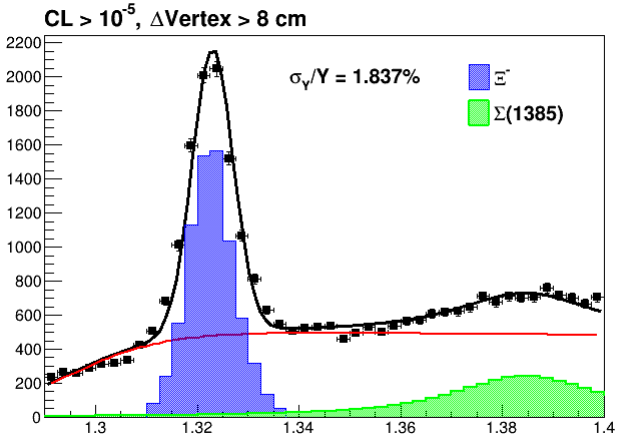

CL > 10^-1, ΔVertex > 8 cm
σY/Y = 2.288%
Ξ-
Σ(1385)

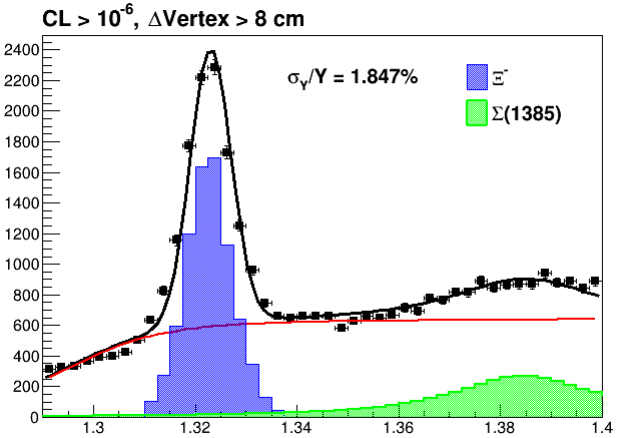

CL > 10^-2, ΔVertex > 8 cm
σY/Y = 1.942%
Ξ-
Σ(1385)

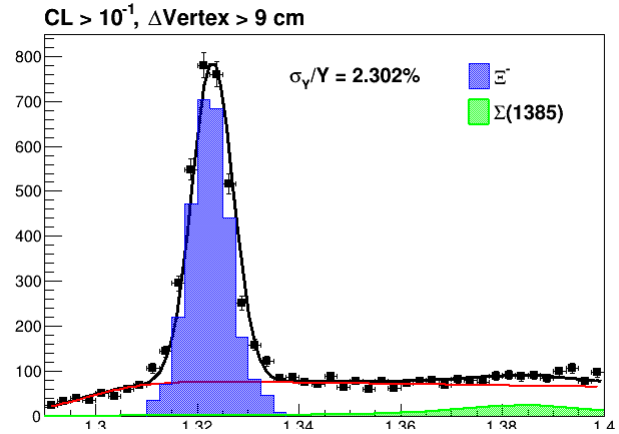
Δvertex > 8 cm

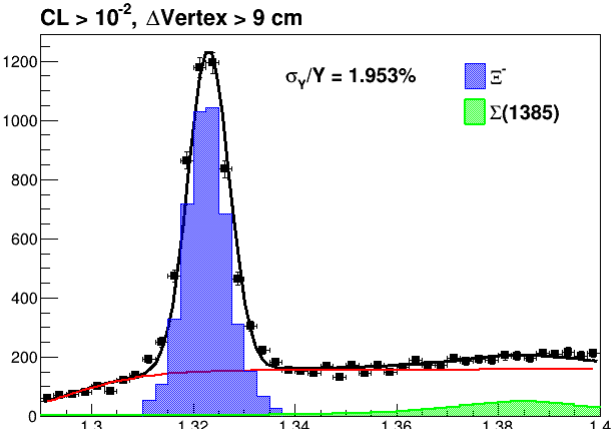

CL > 10^-3, ΔVertex > 8 cm
σY/Y = 1.859%
Ξ-
Σ(1385)


CL > 10^-4, ΔVertex > 8 cm
σY/Y = 1.832%
Ξ-
Σ(1385)
Best on slide

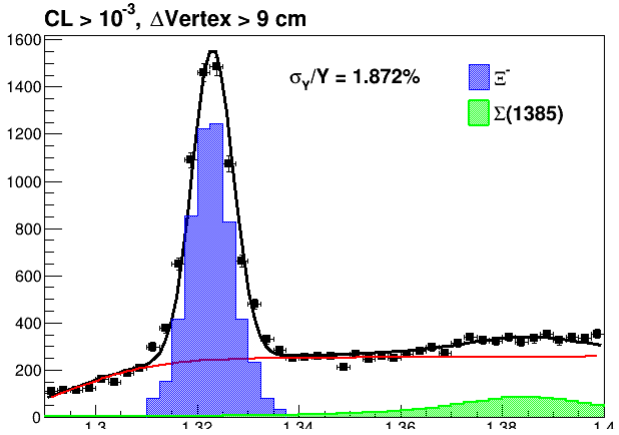

CL > 10^-5, ΔVertex > 8 cm
σY/Y = 1.837%
Ξ-
Σ(1385)

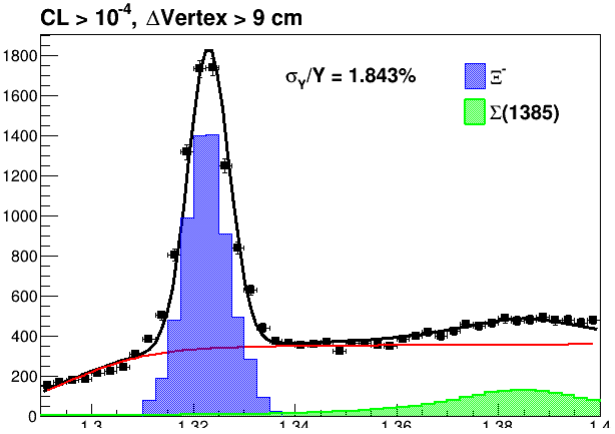

CL > 10^-6, ΔVertex > 8 cm
σY/Y = 1.847%
Ξ-
Σ(1385)

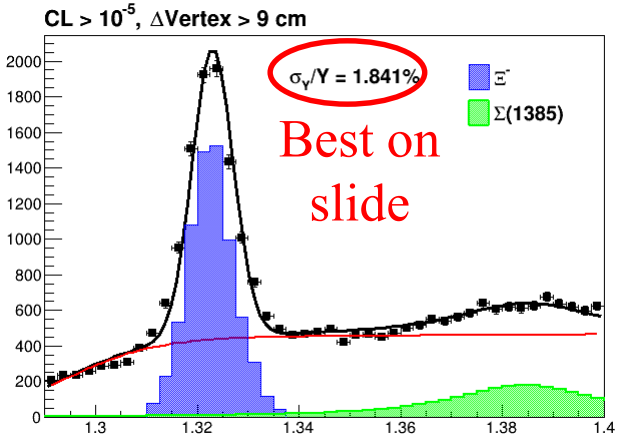

CL > 10^-1, ΔVertex > 9 cm
σY/Y = 2.302%
Ξ-
Σ(1385)

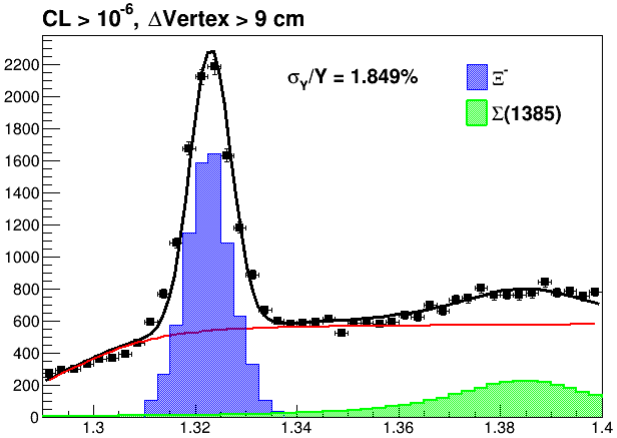

CL > 10^-2, ΔVertex > 9 cm
σY/Y = 1.953%
Ξ-
Σ(1385)

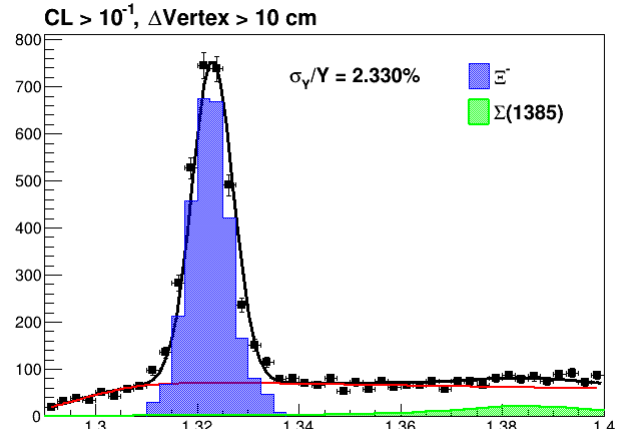
Δvertex > 9 cm

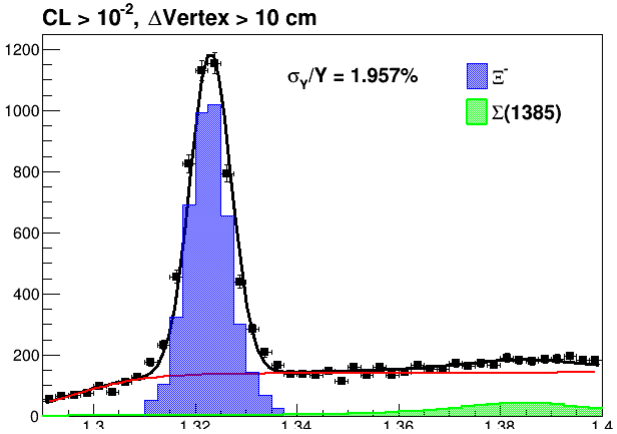

CL > 10^-3, ΔVertex > 9 cm
σY/Y = 1.872%
Ξ-
Σ(1385)

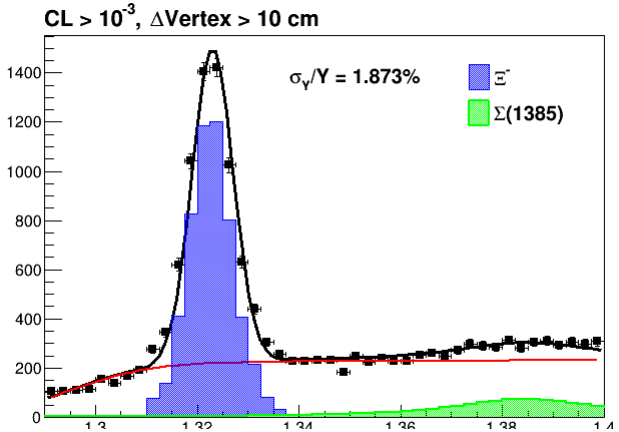

CL > 10^-4, ΔVertex > 9 cm
σY/Y = 1.843%
Ξ-
Σ(1385)

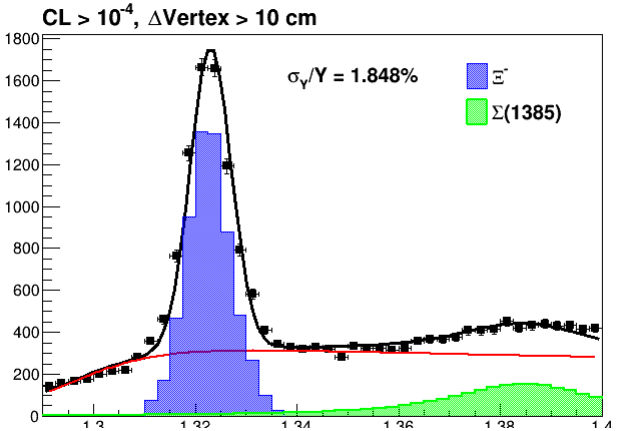

CL > 10^-5, ΔVertex > 9 cm
σY/Y = 1.841%
Ξ-
Σ(1385)
Best on slide

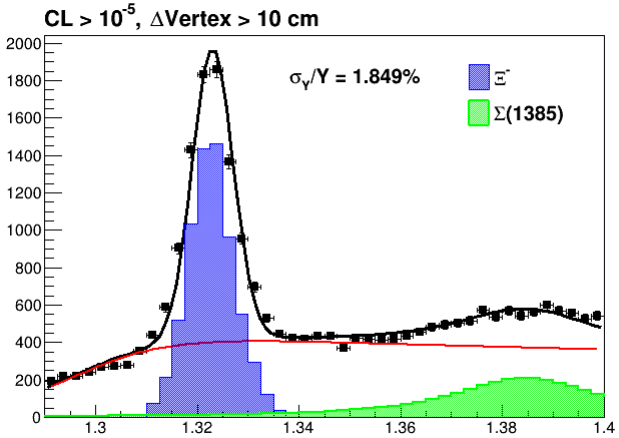

CL > 10^-6, ΔVertex > 9 cm
σY/Y = 1.849%
Ξ-
Σ(1385)

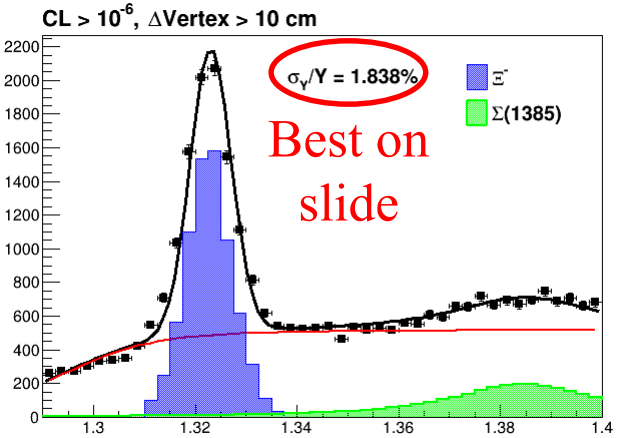






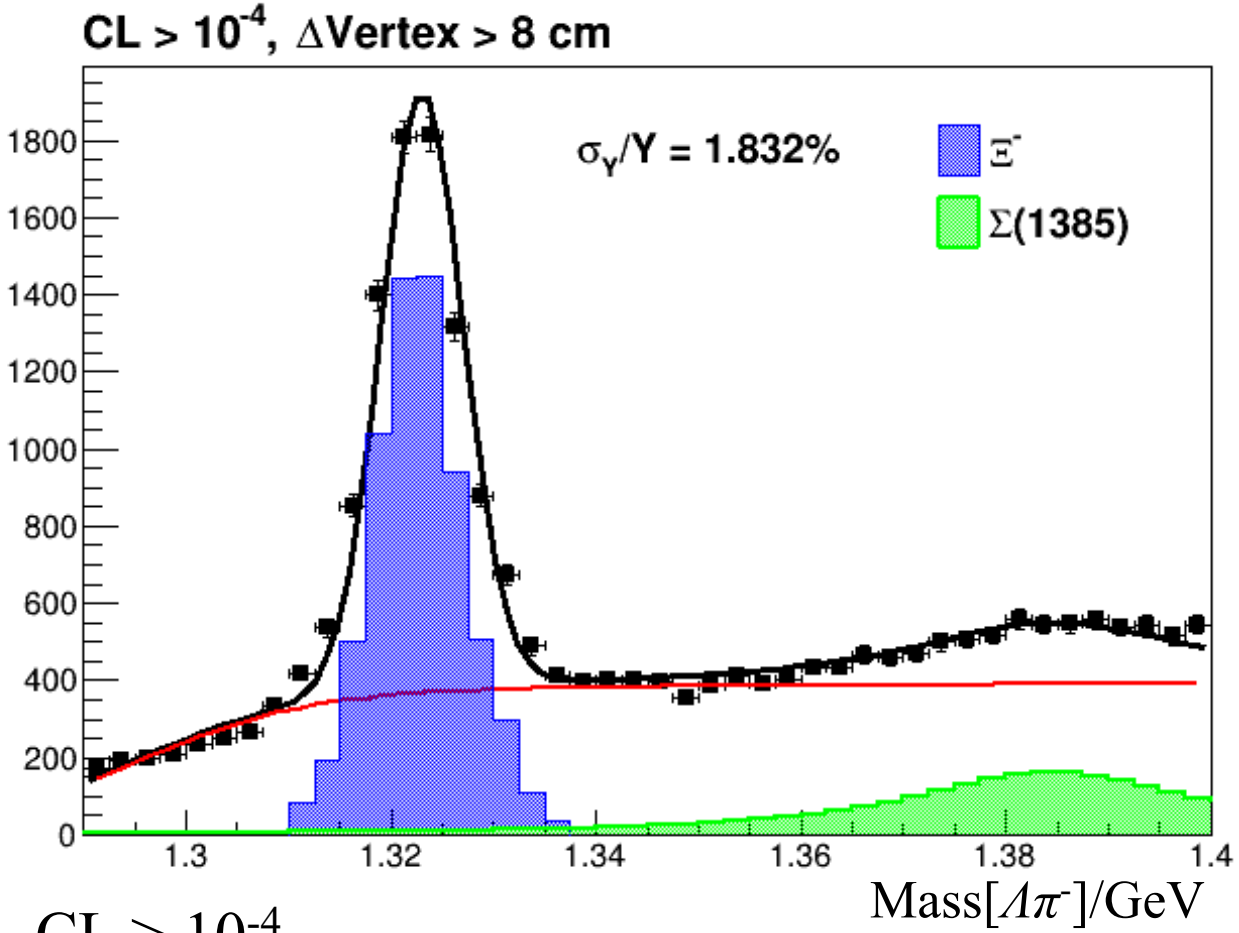






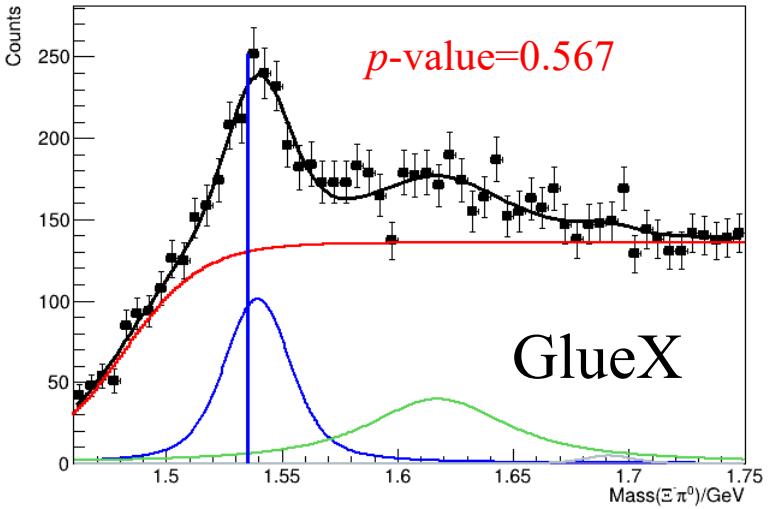
Δvertex > 10 cm

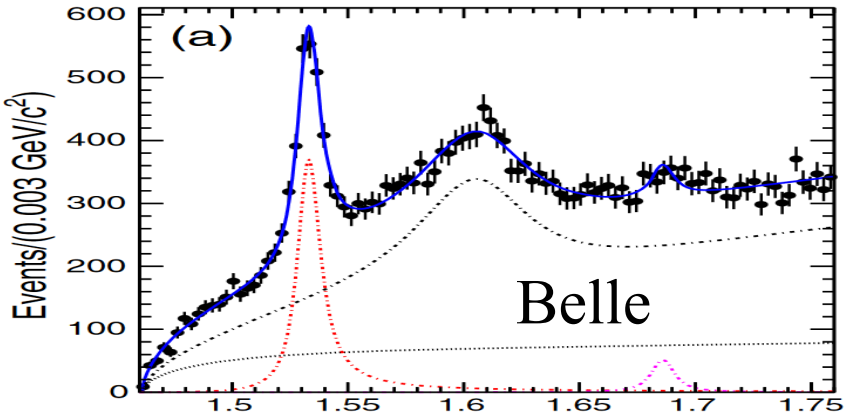
Overall best (lowest value of σ_Y/Y)



- CL > 10^{-4}
- ΔVertex > 8cm

Comparison to Belle

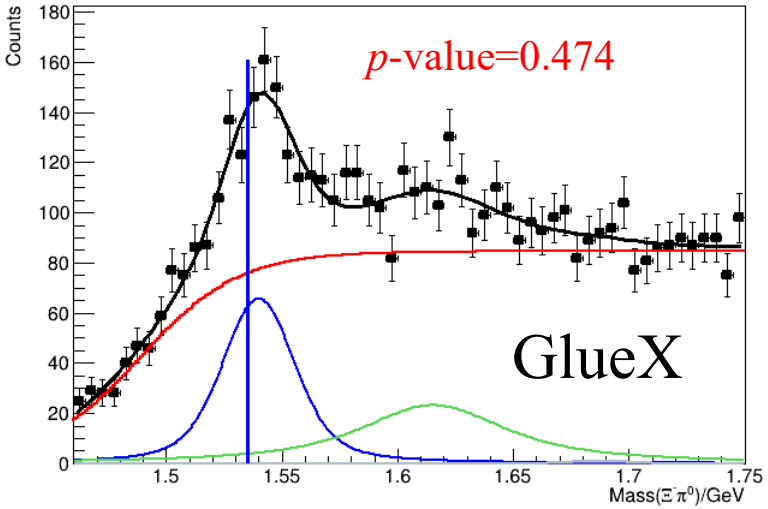


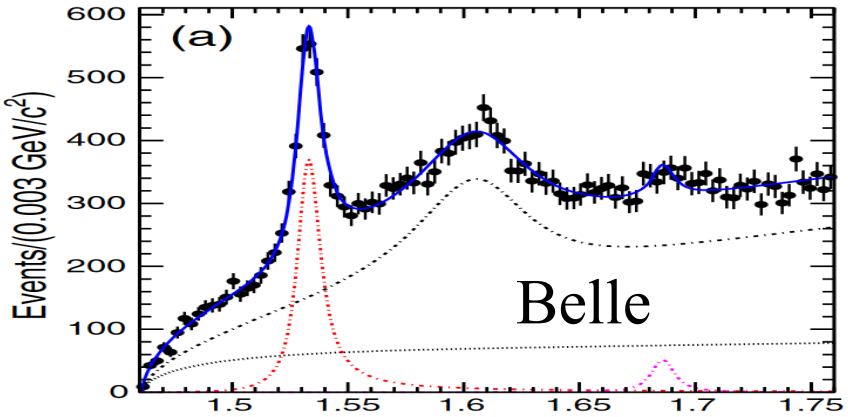


Cuts on GlueX data:

- CL>10^{-4}
- ΔVertex > 0 cm (NO ΔVertex cut)
- Ξ^- cut:
  - Kept event when
    1.30 < mass[$\Lambda\pi^-$]/GeV < 1.35
- K^* cut: None

Comparison to Belle

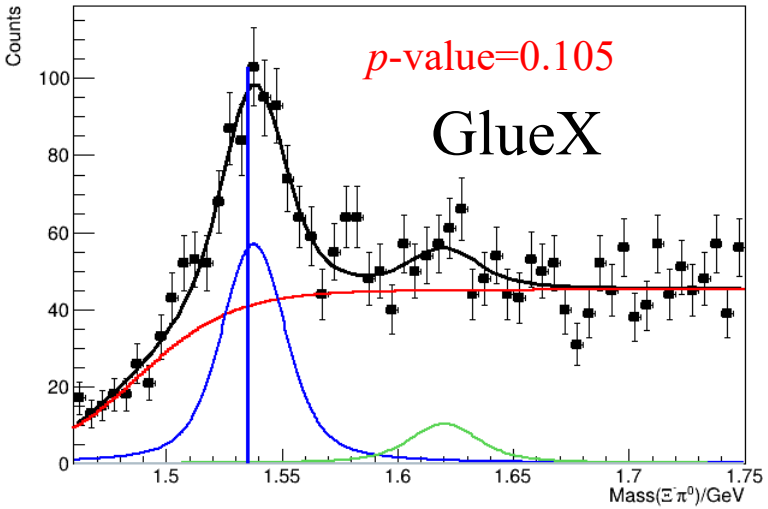


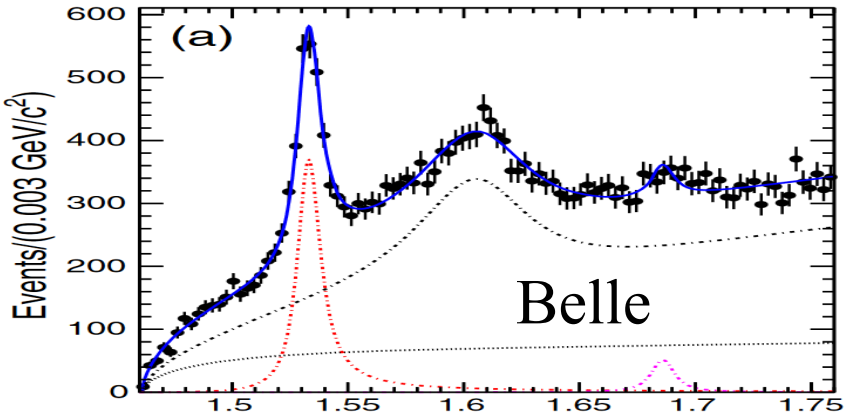


Cuts on GlueX data:

- CL>10^{-4}
- ΔVertex > 0 cm (NO ΔVertex cut)
- Ξ^- cut:
  - Kept event when
    $1.30 < \text{mass}[\Lambda\pi^-]/\text{GeV} < 1.35$
- K^* cut:
  - Remove event when
    $0.85 < \text{mass}[K^+\pi^0]/\text{GeV} < 0.95$

Comparison to Belle

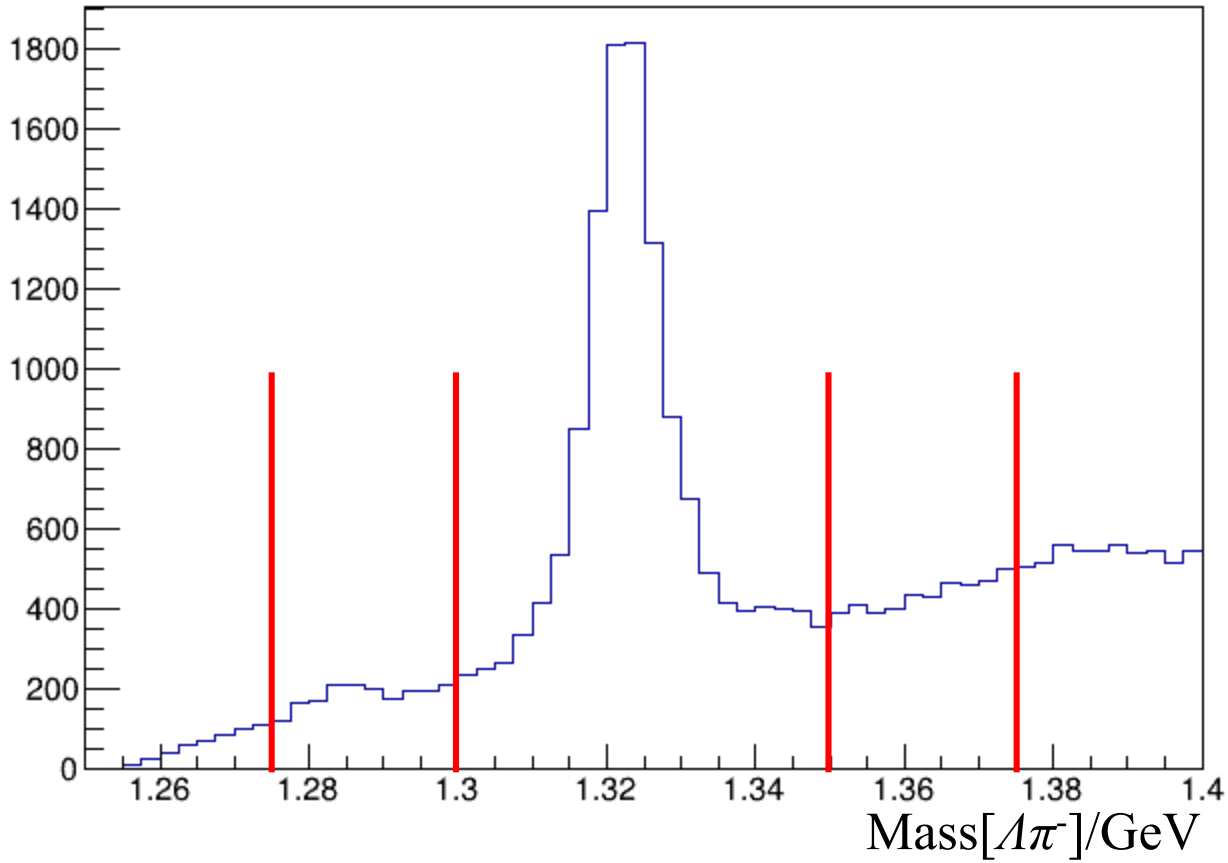




Cuts on GlueX data:

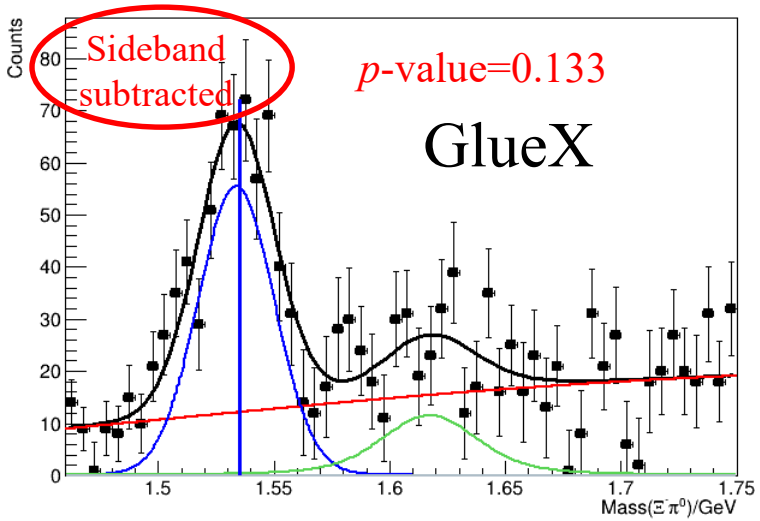
- CL>10^{-4}
- ΔVertex > 8 cm
- Ξ^- cut:
  - Kept event when
    $1.30 < \text{mass}[\Lambda\pi^-]/\text{GeV} < 1.35$
- K^* cut:
  - Remove event when
    $0.85 < \text{mass}[K^+\pi^0]/\text{GeV} < 0.95$

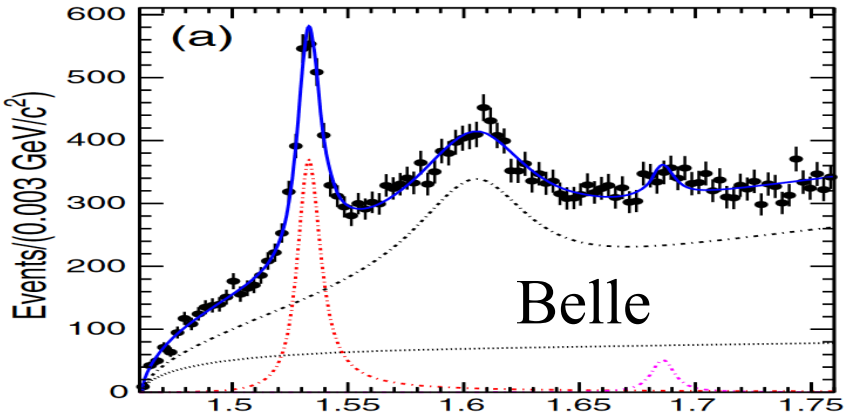
Sidebands



- CL > 10^{-4}, ΔVertex > 8cm
- For a quick and easy background subtraction

Comparison to Belle

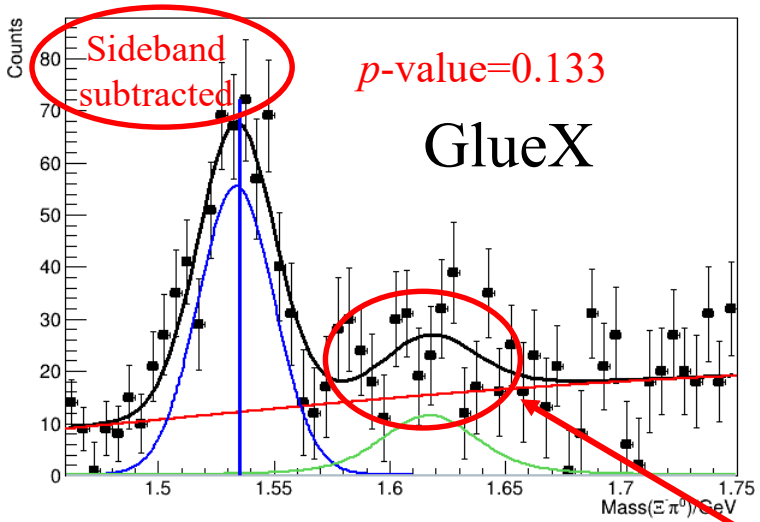


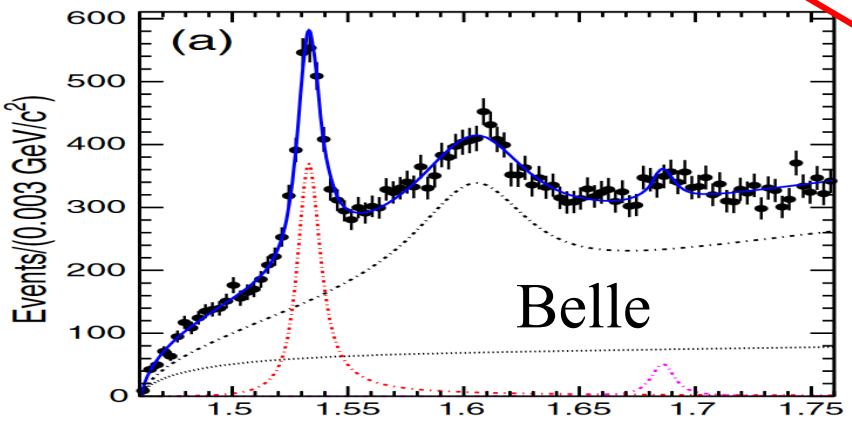


Cuts on GlueX data:

- CL>10^{-4}
- ΔVertex > 8 cm
- Ξ^- cut:
  - Kept event when
    $1.30 < \text{mass}[\Lambda\pi^-]/\text{GeV} < 1.35$
- K^* cut:
  - Remove event when
    $0.85 < \text{mass}[K^+\pi^0]/\text{GeV} < 0.9$

Comparison to Belle



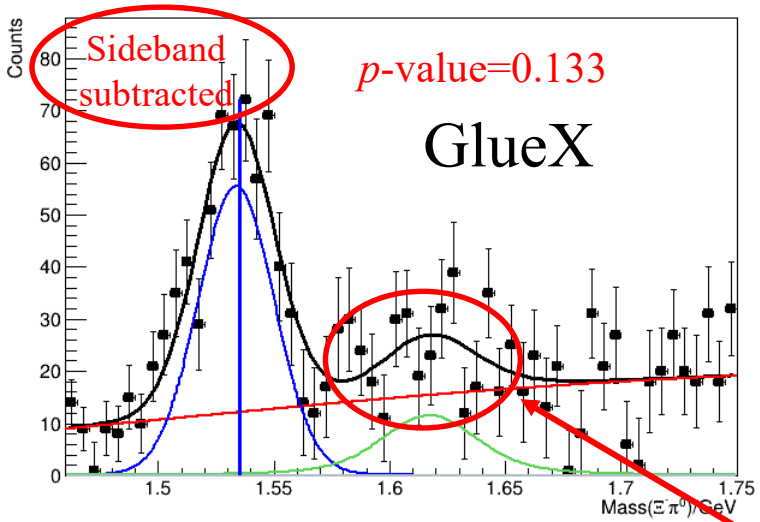


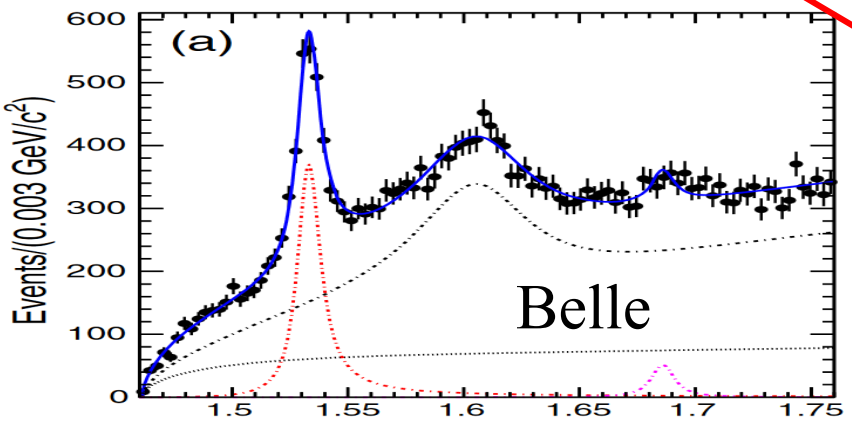
Cuts on GlueX data:

- CL>10^{-4}
- ΔVertex > 8 cm
- Ξ^- cut:
  - Kept event when
    $1.30 < \text{mass}[\Lambda\pi^-]/\text{GeV} < 1.35$
- K^* cut:
  - Remove event when
    $0.85 < \text{mass}[K^+\pi^0]/\text{GeV} < 0.9$

Error bars way too big with respect to bump height ☹

Comparison to Belle





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- The CL and ΔVertex cuts are too restrictive?
- Need a better way to choose CL and ΔVertex cuts?
- Need a better way to remove background