

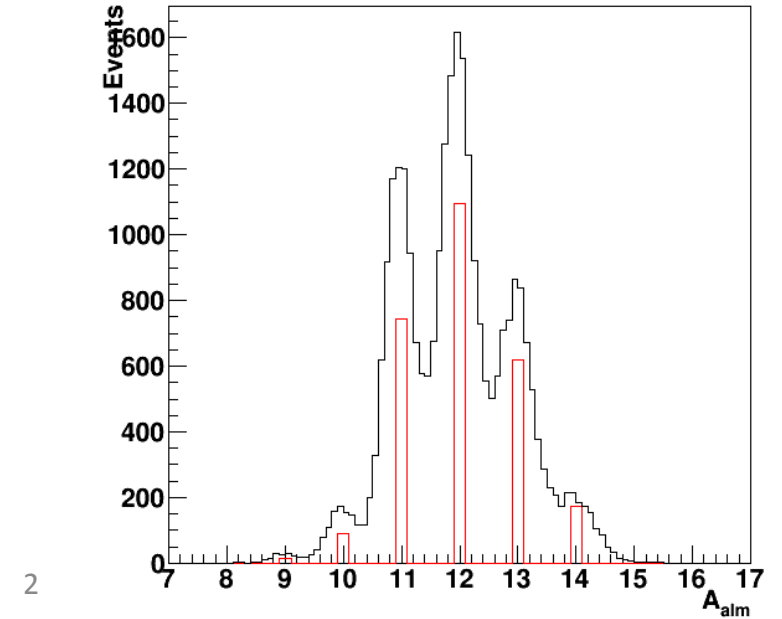
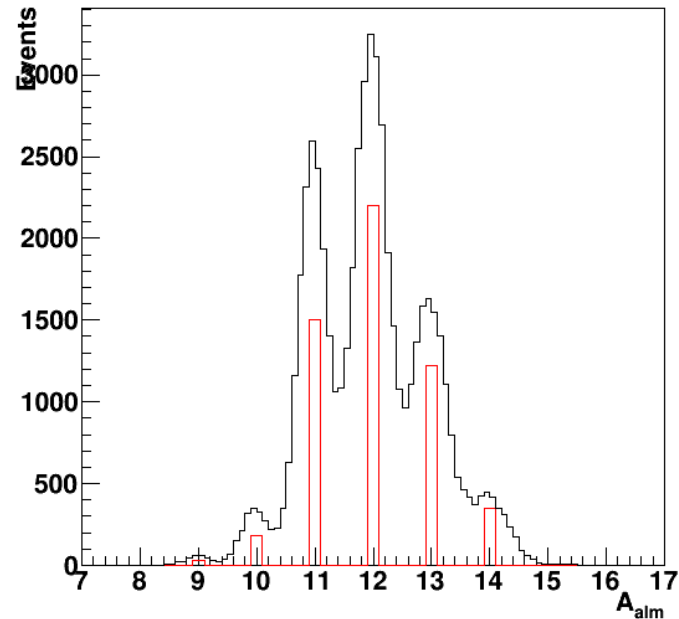
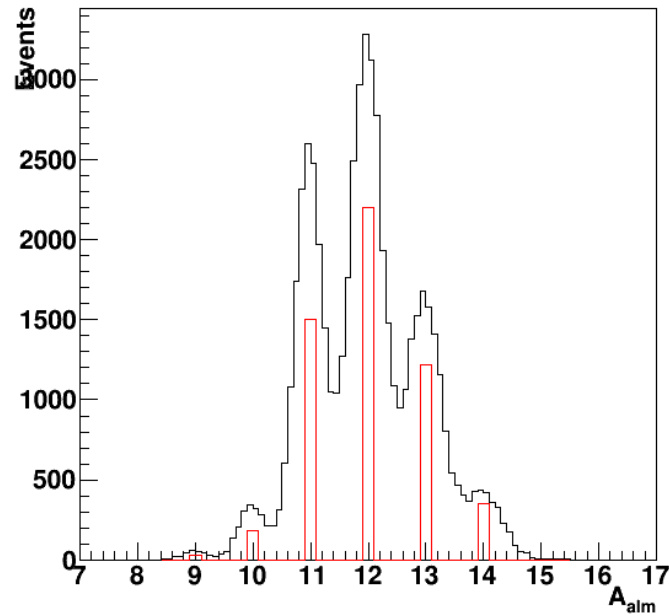
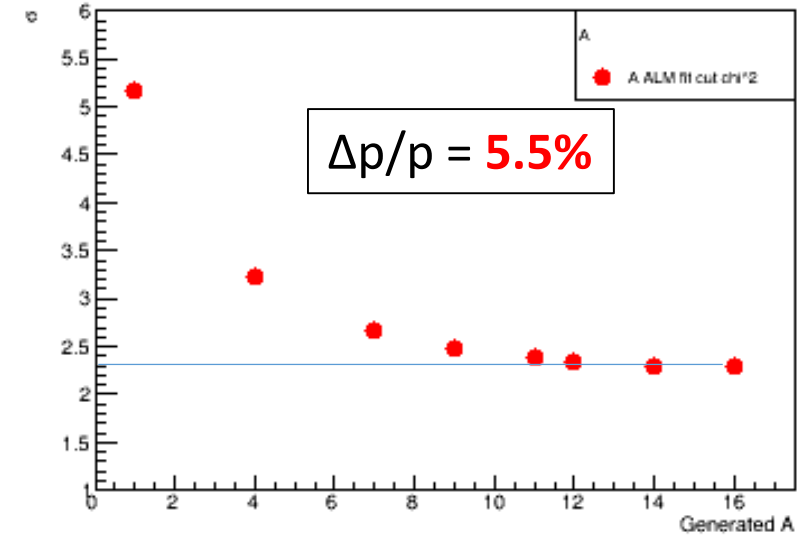
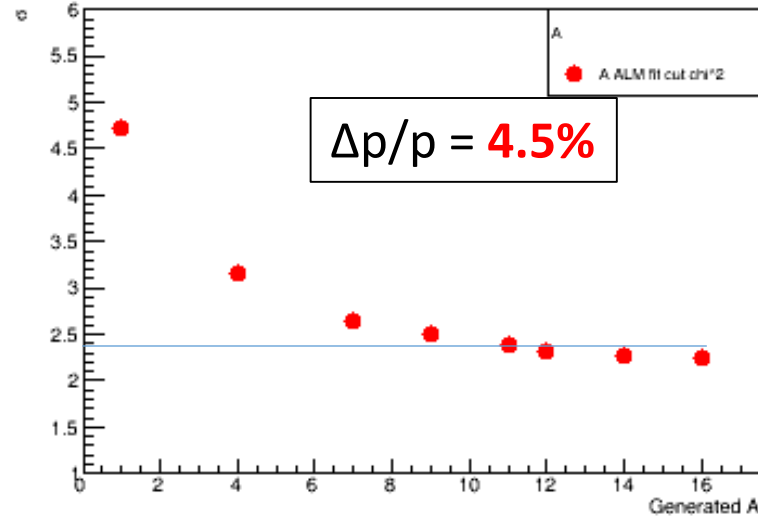
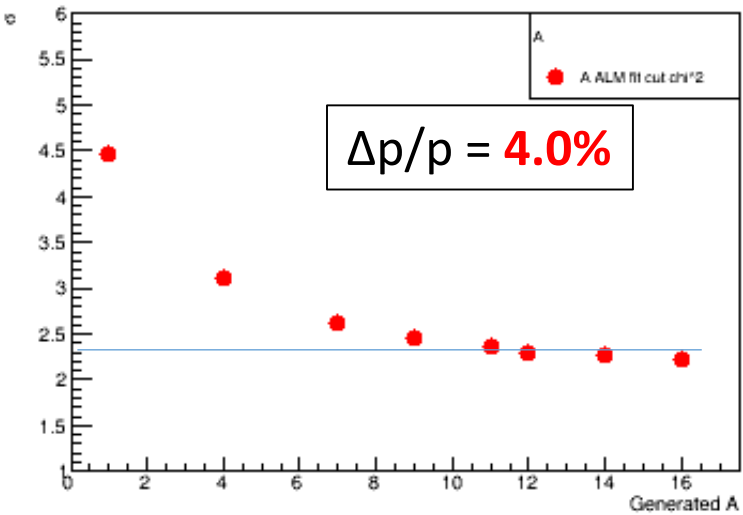
***Systematic study on the Number of mass precision
@ 200 – 350 – 700 MeV depending on the***

- Momentum***
- Tof***
- SCN position***

Mass Resolution @200 MeV varying resolution on p

Mass Reconstructed with all methods, here **ALM**

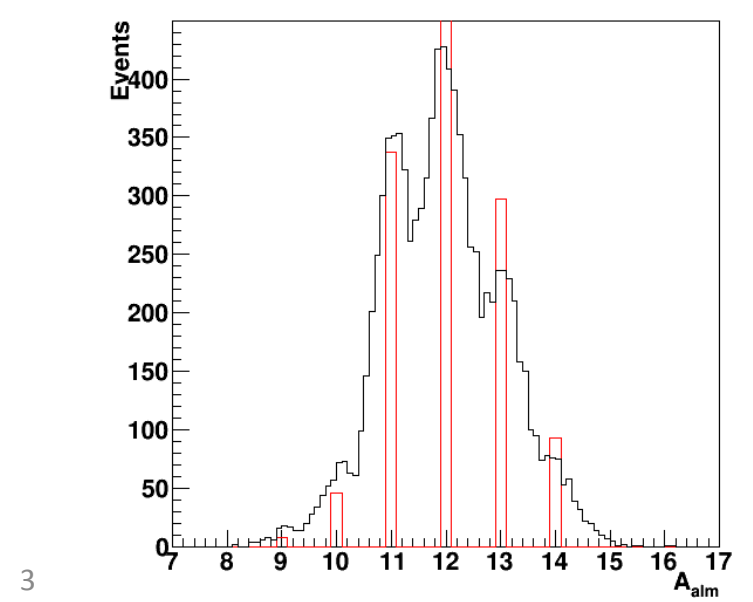
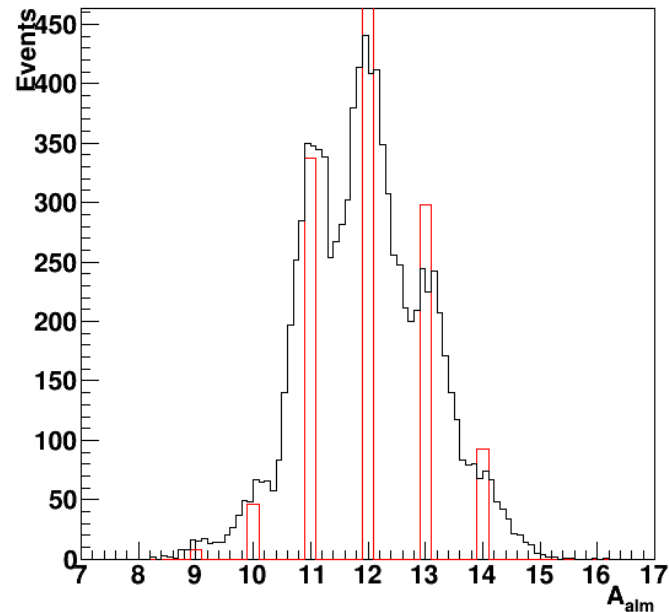
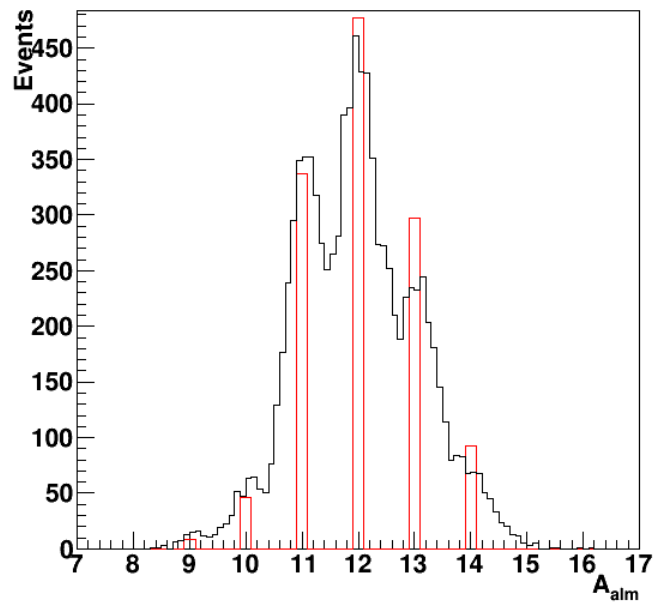
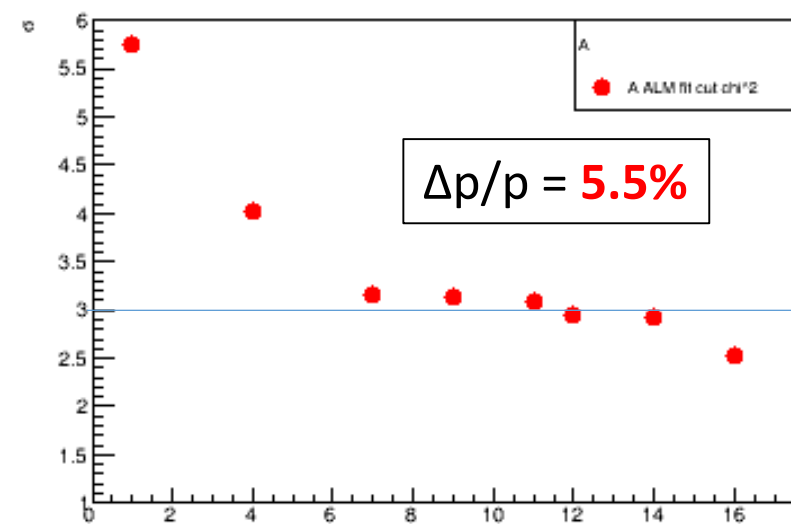
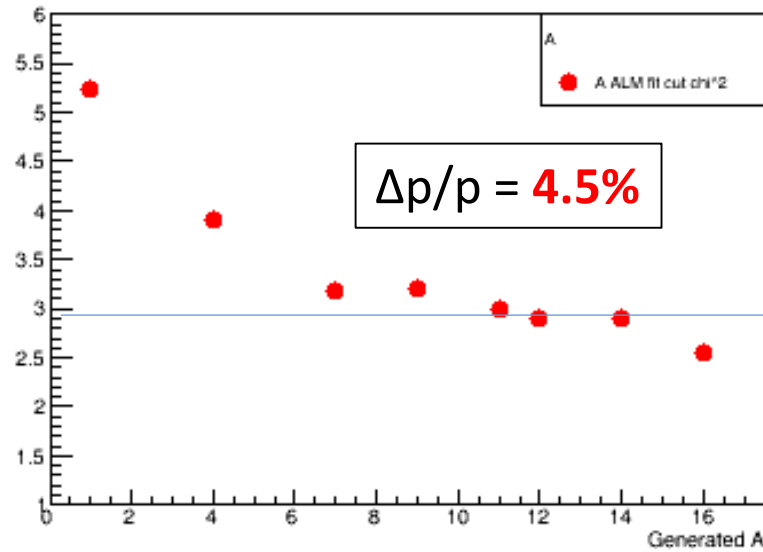
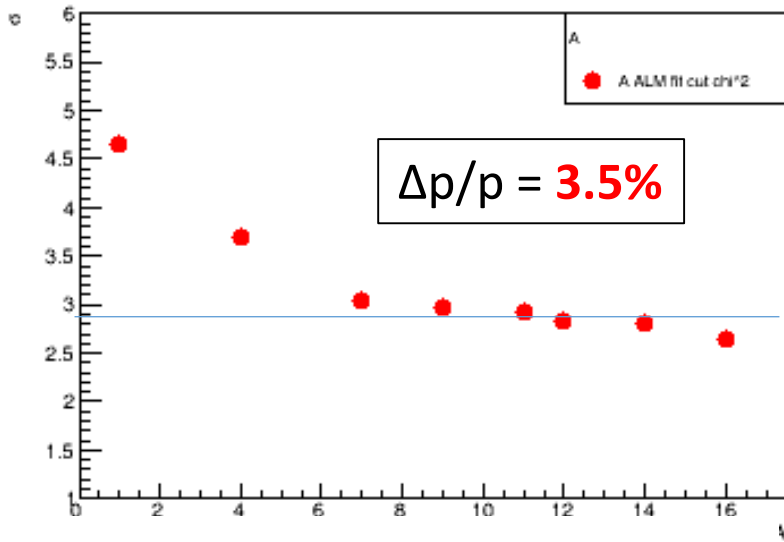
- $E_{\text{kin}} \rightarrow 1.0\%$
- Tof : 100 (H): **50 (C)** ps
- SCN = **1m**



Mass Resolution @350 MeV varying resolution on p

Mass Reconstructed with all methods, here **ALM**

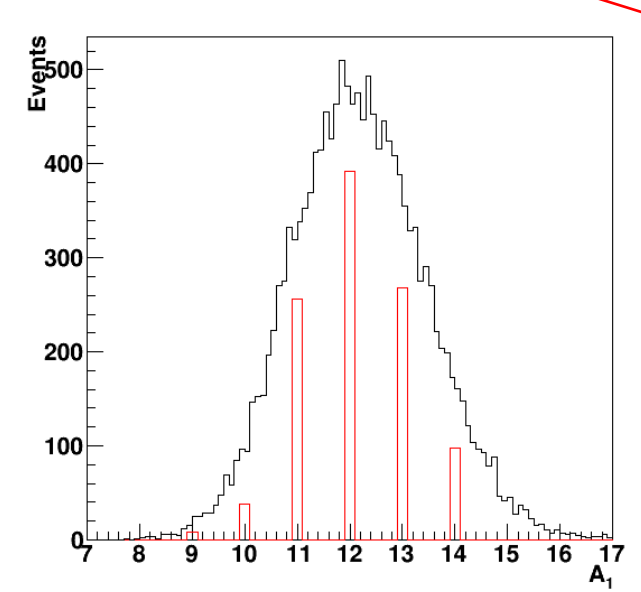
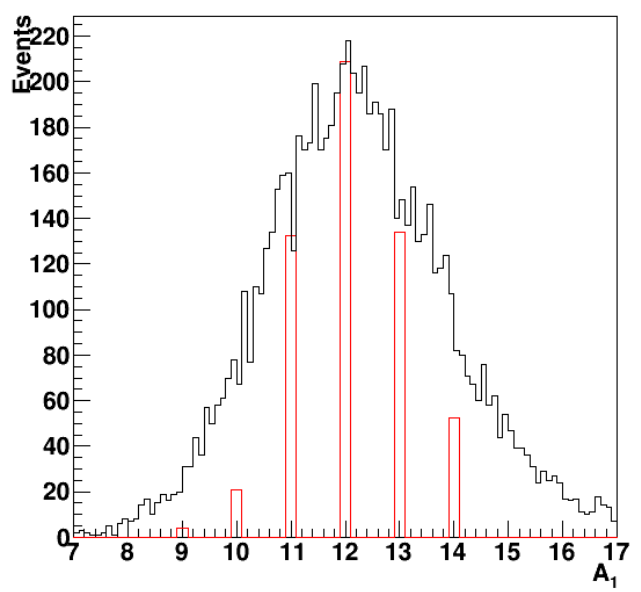
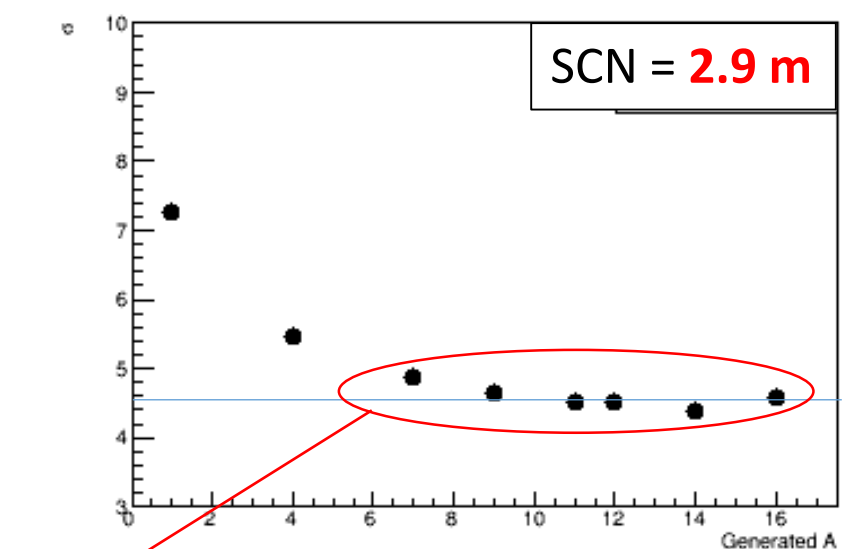
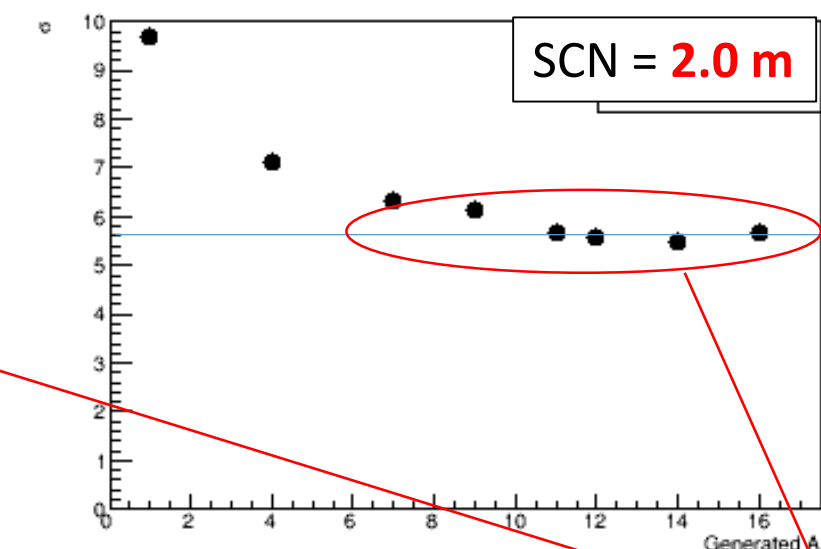
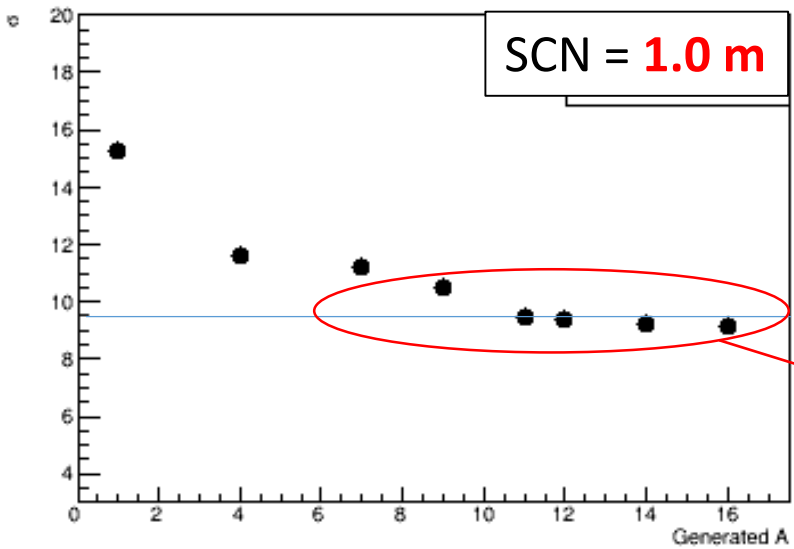
- $E_{\text{kin}} \rightarrow 1.0\%$
- Tof : 130 (H): **66 (C)** ps
- SCN = **1.5 m**



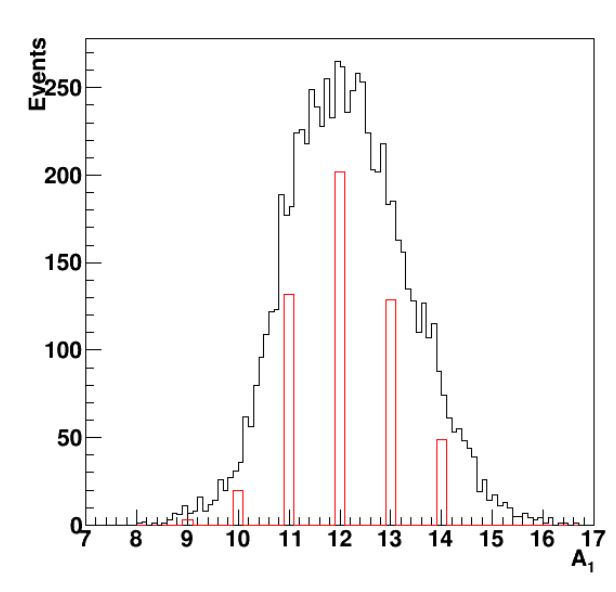
Mass Resolution @700 MeV varying position of SCN

- $E_{\text{kin}} \rightarrow 1.0\%$
- Tof : 190 (H): **94 (C)** ps
- $p \rightarrow 3.0\%$

Mass Reconstructed with only **p-tof** method



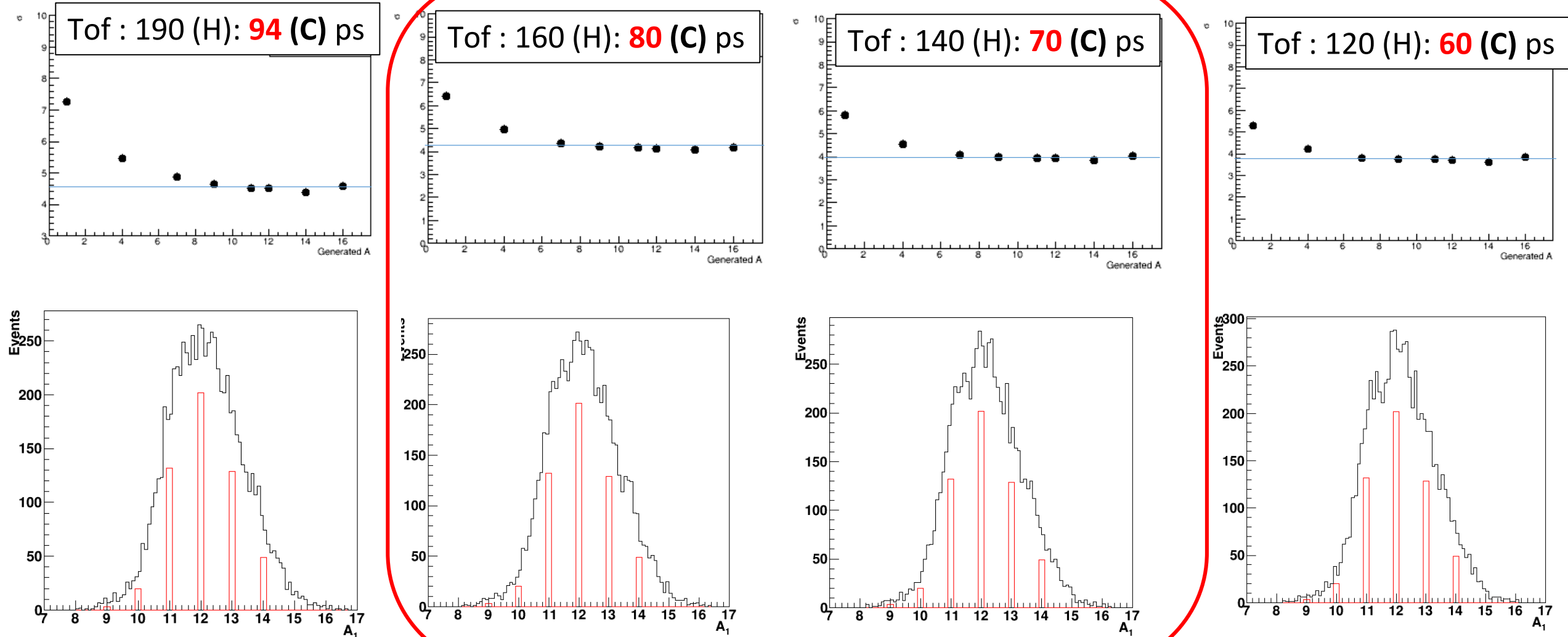
Necessity to move SCN



Mass Resolution @700 MeV varying resolution of TOF

□ p → 3.0%
□ SCN = 2.9 m

Mass Reconstructed with only p-tof method



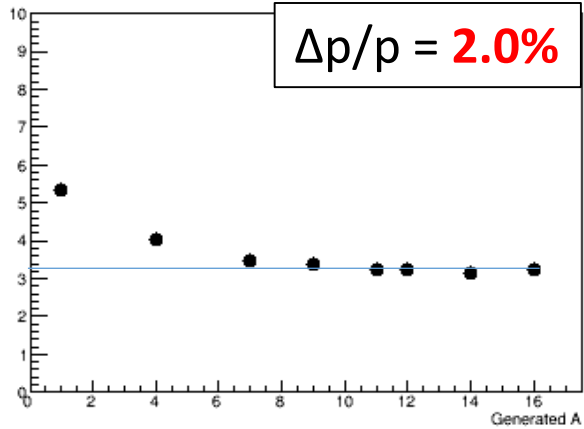
An hint of Isotope separation begin at about 60-70 ps of tof resolution

Mass Resolution @700 MeV varying resolution of p

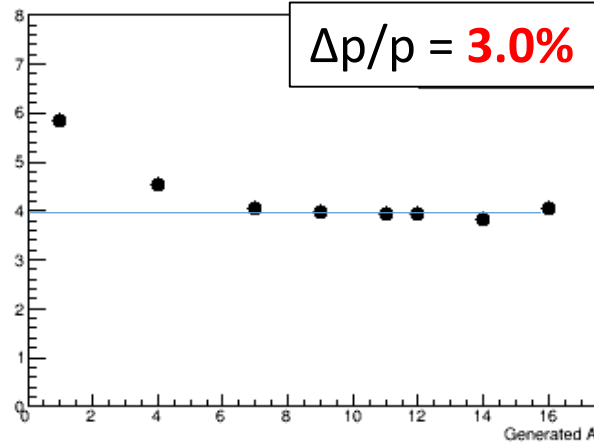
- ToF : 140 (H): **70 (C)** ps
- SCN = **2.9 m**

Mass Reconstructed with only p-tof method

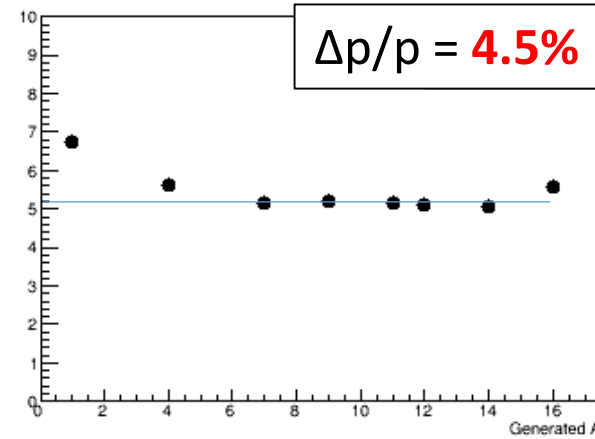
$\Delta p/p = 2.0\%$



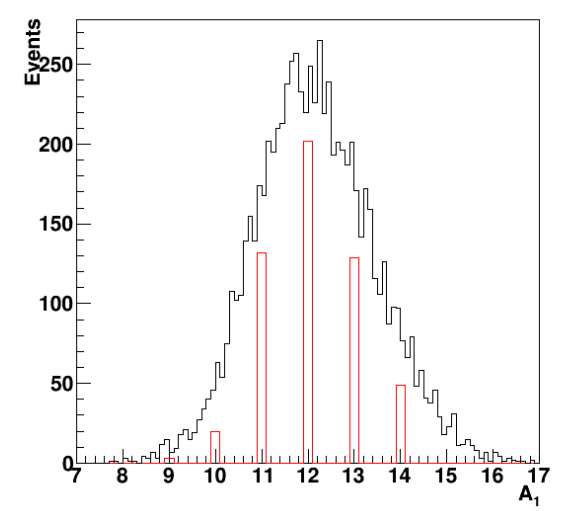
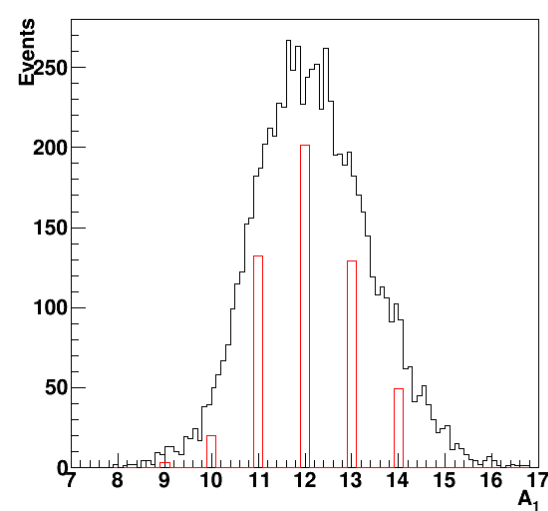
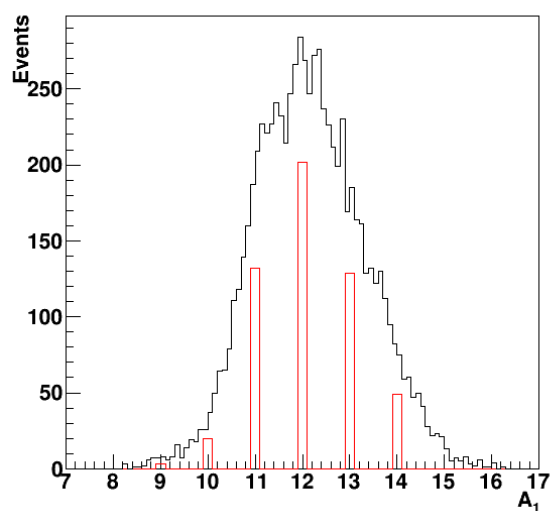
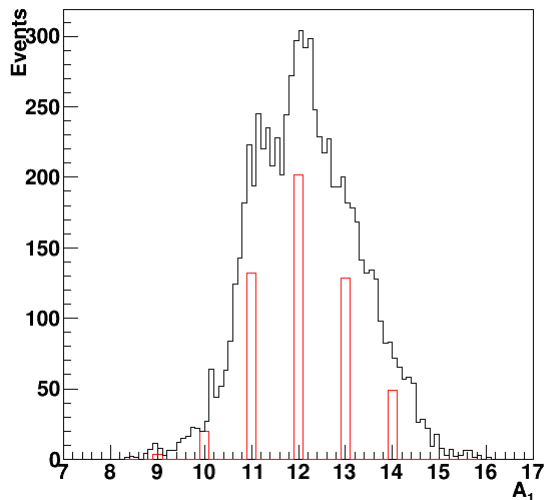
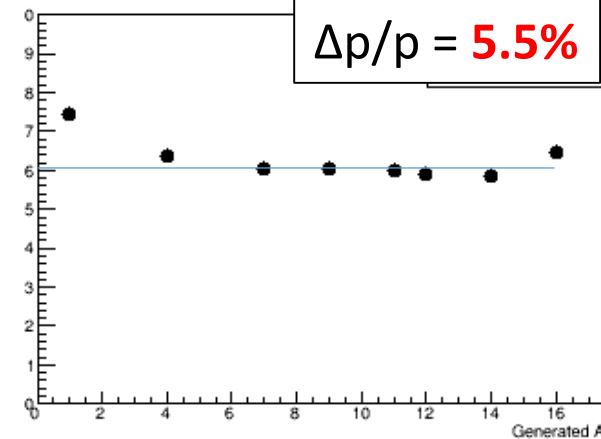
$\Delta p/p = 3.0\%$



$\Delta p/p = 4.5\%$



$\Delta p/p = 5.5\%$



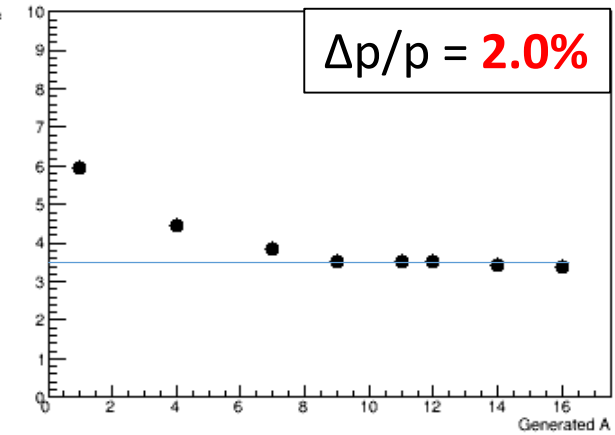
If ToF resolution = 70 ps \rightarrow hint of Isotope separation for momentum resolution at 2%

Mass Resolution @700 MeV varying resolution of p

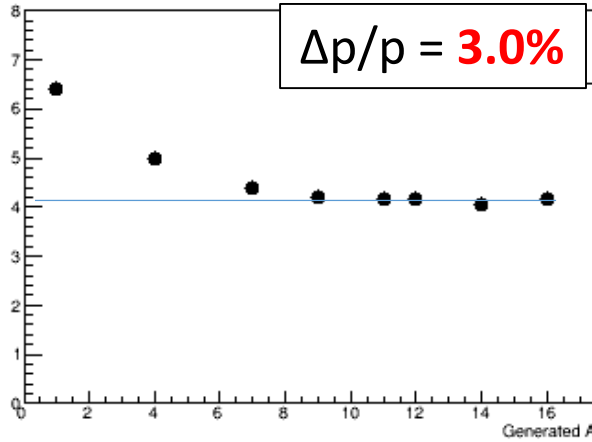
- $E_{\text{kin}} \rightarrow 1.0\%$
- Tof : 160 (H): **80 (C)** ps
- SCN = **2.9 m**

Mass Reconstructed with only **p-tof** method

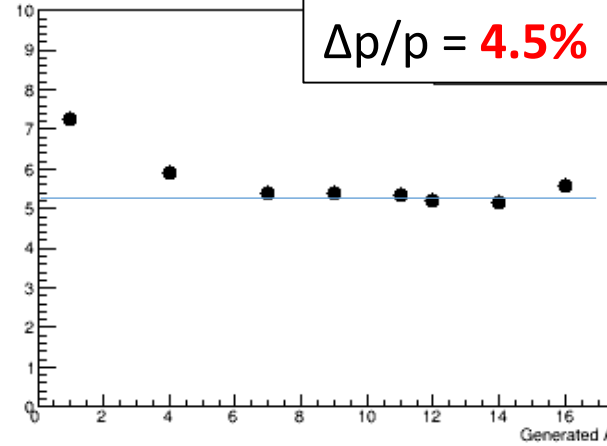
$\Delta p/p = 2.0\%$



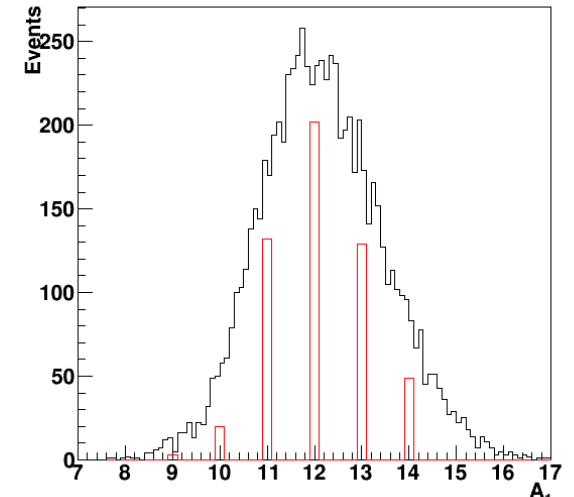
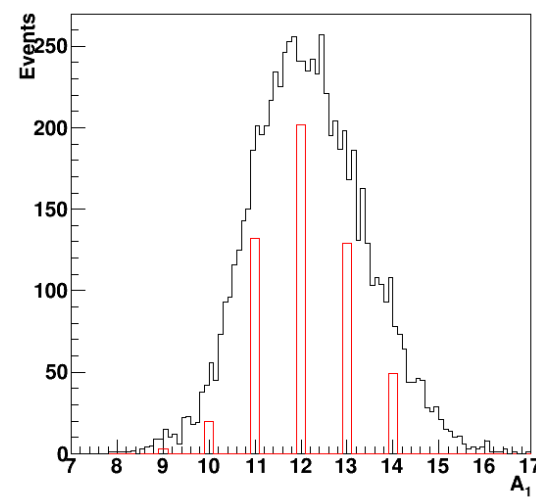
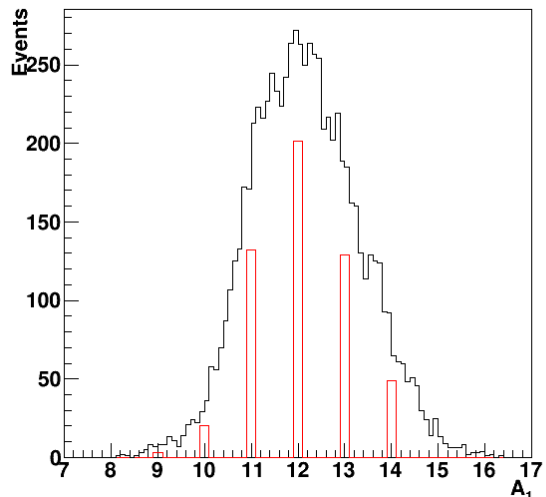
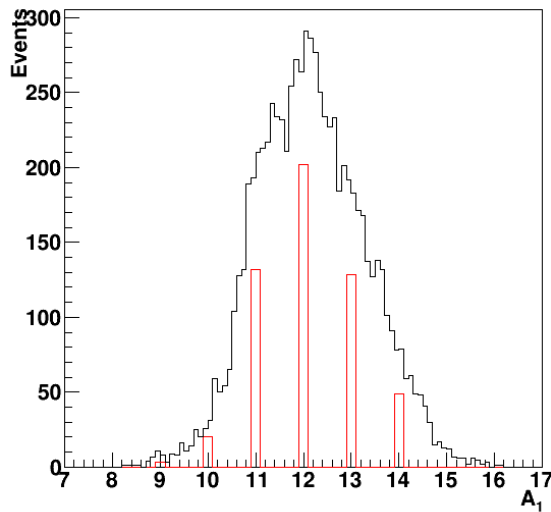
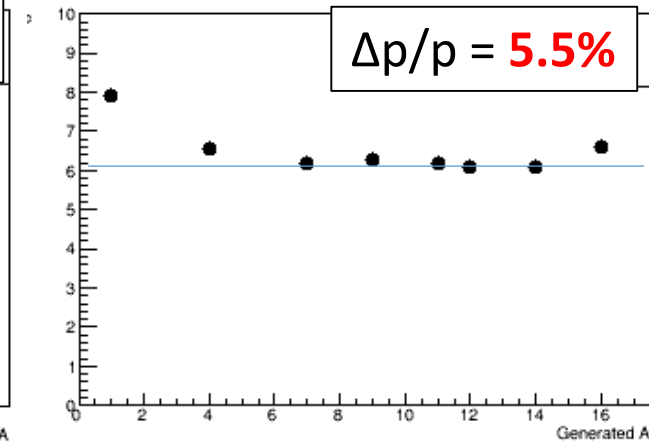
$\Delta p/p = 3.0\%$



$\Delta p/p = 4.5\%$



$\Delta p/p = 5.5\%$



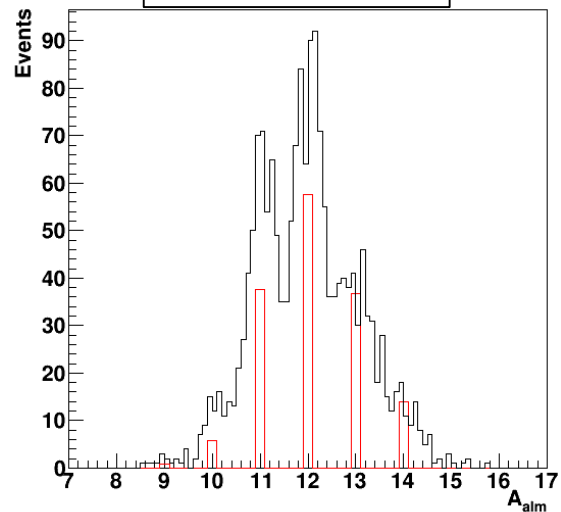
If Tof resolution = 80 ps \rightarrow hint of Isotope separation for momentum resolution at 2%

Mass Resolution @700 MeV varying resolution of p

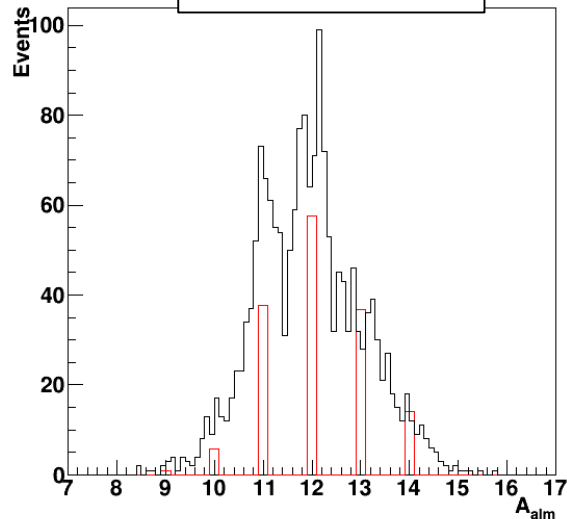
- $E_{\text{kin}} \rightarrow 1.0\%$
- Tof : 140-160 (H): **70-80 (C)** ps
- SCN = **2.9 m**

Mass Reconstructed with only **ALM FIT** + $\chi^2 < 5$

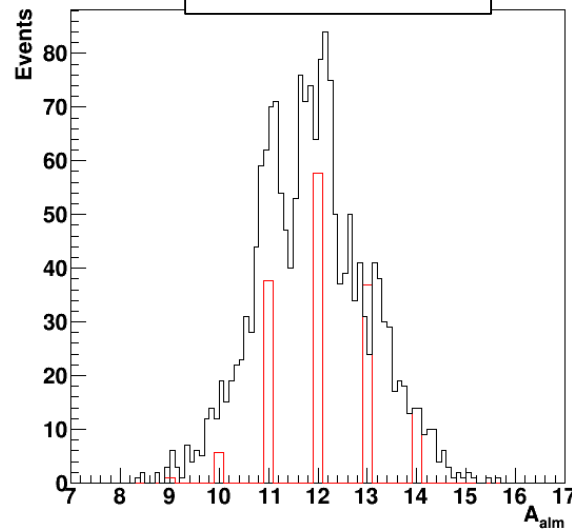
$\Delta p/p = 2.0\%$



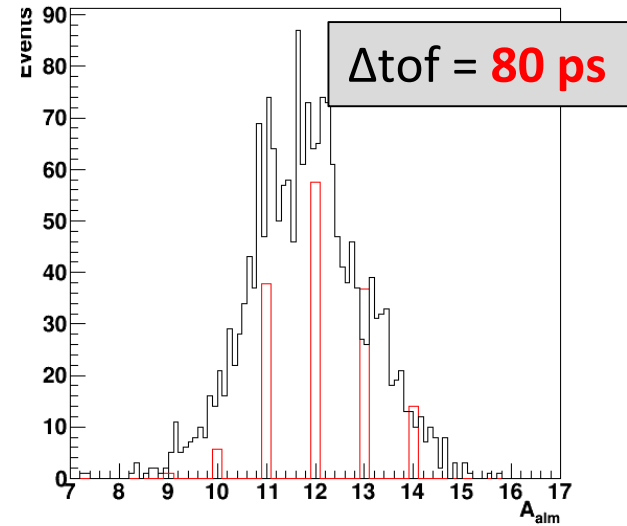
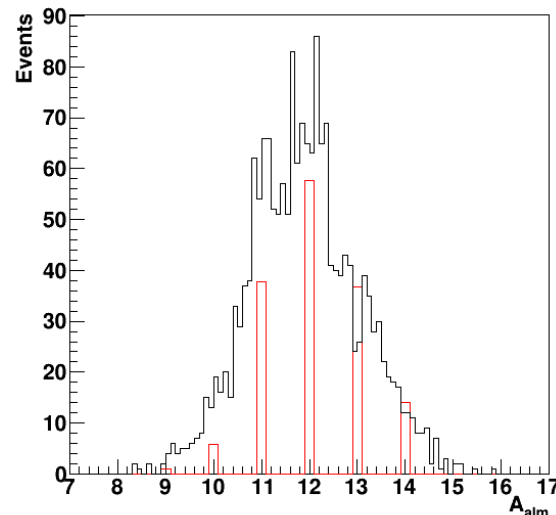
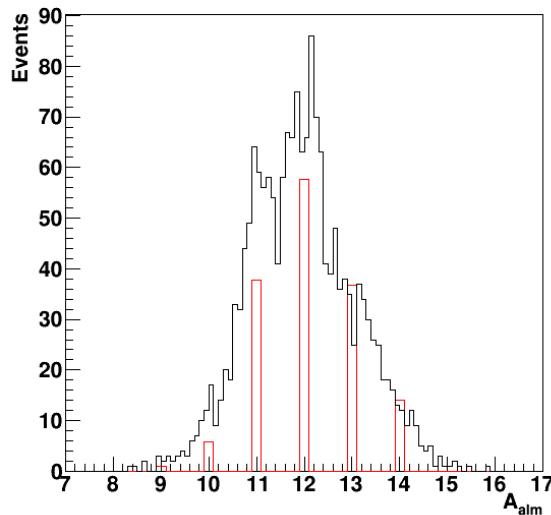
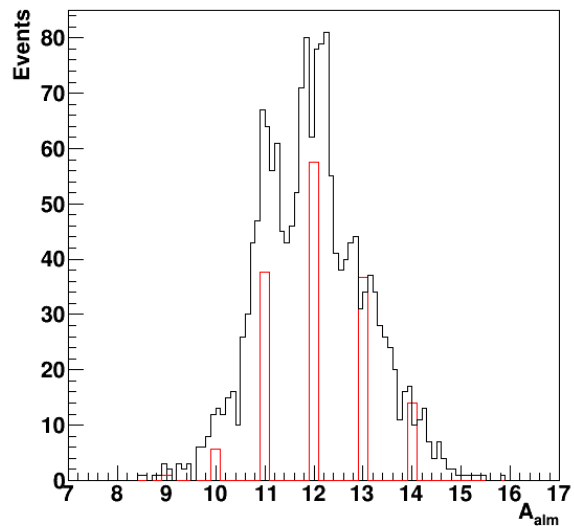
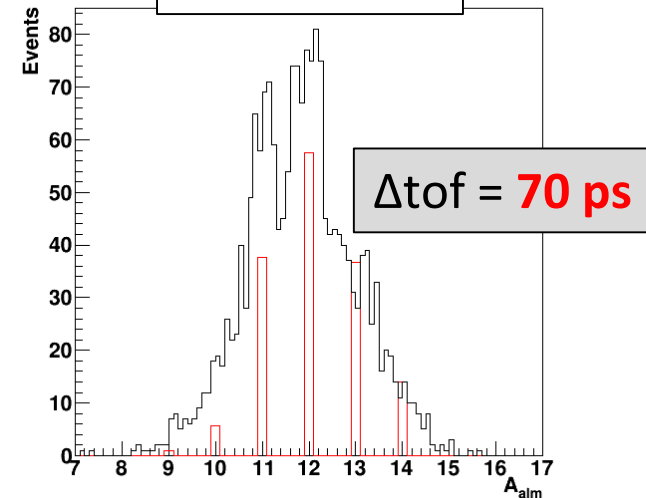
$\Delta p/p = 3.0\%$



$\Delta p/p = 4.5\%$



$\Delta p/p = 5.5\%$



Conclusion

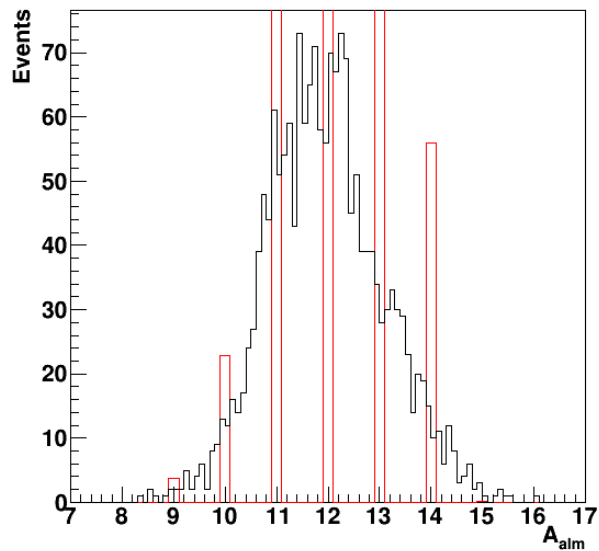
- ❑ **200 MeV: A reconstructed with ALM Fit method**
 - ❑ Tof=50 ps (on C), $E_{kin} = 1\%$, **SCN = 1m**
 - ❑ Isotope separation for all the momentum resolution tested ($4.0 < \Delta p/p < 5.5$)
- ❑ **350 MeV: A reconstructed with ALM Fit method**
 - ❑ Tof=66 ps (on C), $E_{kin} = 1\%$, **SCN = 1.5m**
 - ❑ Isotope separation for all the momentum resolution tested ($3.5 < \Delta p/p < 5.5$)
- ❑ **700 MeV: A reconstructed with only p-tof method**
 - ❑ Tof=70-80 ps (on C), **SCN = 2.9m**
 - ❑ Isotope separation only if momentum resolution at level of 2-3%
- ❑ **700 MeV: A reconstructed with ALM Fit method**
 - ❑ Tof=70-80 ps (on C), $E_{kin} = 1\%$, **SCN = 2.9m**
 - ❑ Isotope separation only if momentum resolution at level of 3-4%

Isotopic separazion @700 MeV varying resolution of TOF

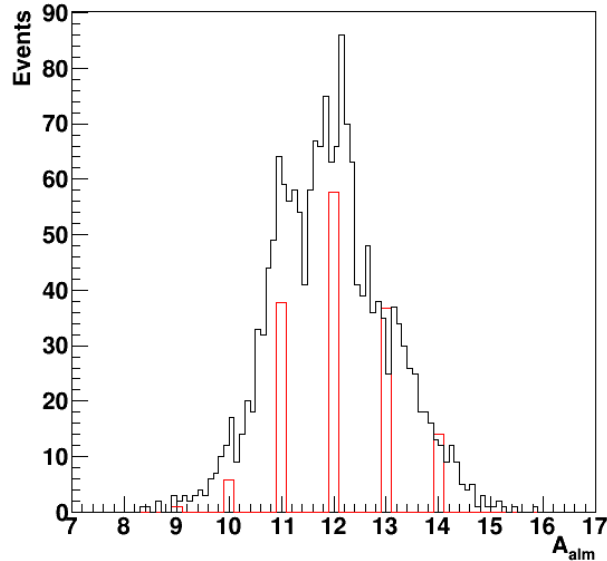
Mass Reconstructed with only **ALM FIT** + $\chi^2 < 5$

- $E_{kin} \rightarrow 1.0\%$
- $p \rightarrow 3.0\%$
- **SCN = 2.9 m**

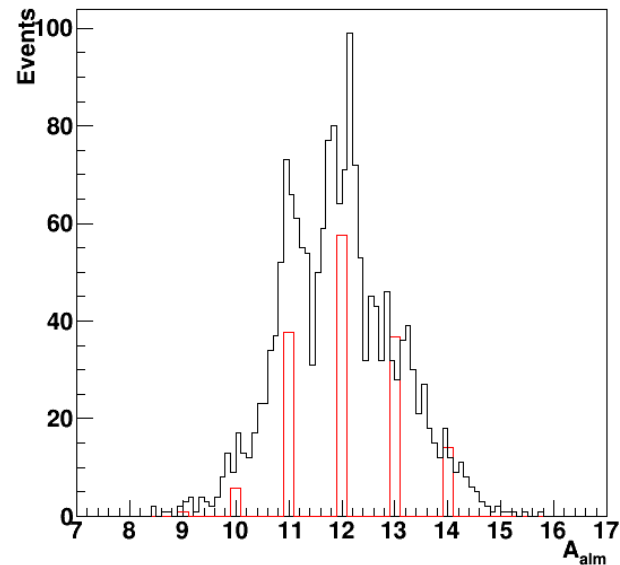
Tof : 190 (H): **94 (C)** ps



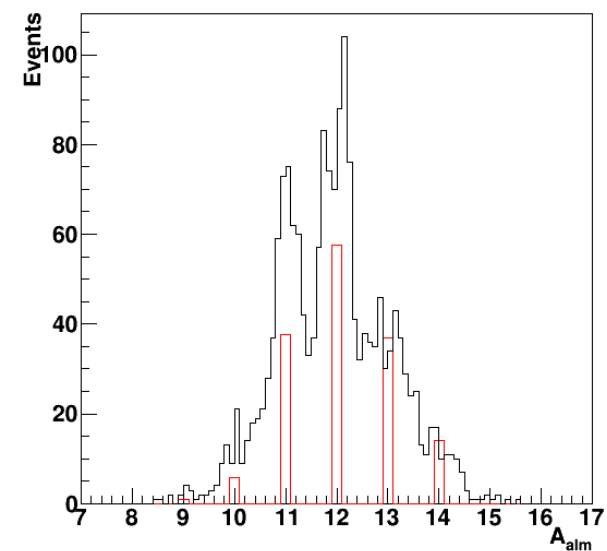
Tof : 160 (H): **80 (C)** ps



Tof : 140 (H): **70 (C)** ps



Tof : 120 (H): **60 (C)** ps



the χ^2 cut decreases the statistic by about a factor 4 ($\sim 25\%$ efficiency), but it allows the isotopes separation