$d(K^-, N)"\pi Y"$ Analysis

Brief report about error estimation

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Summary of error estimation
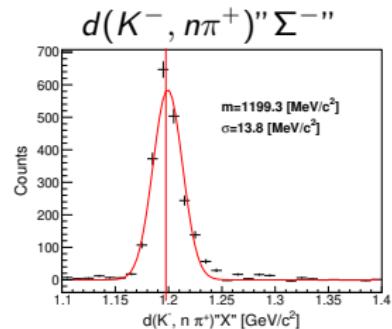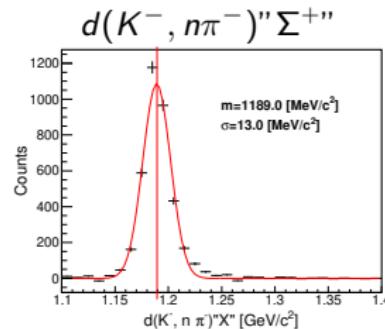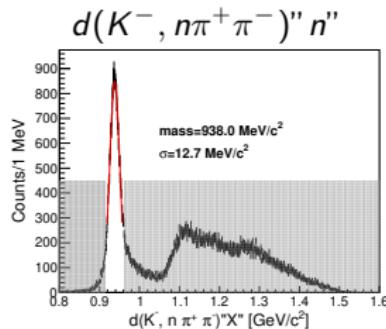
- Difference of horizontal axis. $\rightarrow$ Estimation using $d(K^-, n\pi^+\pi^-)"n"$, $d(K^-, n\pi^-)"\Sigma^+"$ and $d(K^-, n\pi^+)"\Sigma^-"$ peaks
  $\rightarrow$ Difference within $2 MeV/c^2$.
- Staticical error of $d(K^-, n\pi^+\pi^-)"n"$ events.
  $\rightarrow \sim 3.9\%$ in maximum bin.
- Systematic error of template fitting $(d(K^-, n\pi^{\mp})"\Sigma^{\pm}")$
  $\rightarrow d(K^-, n\pi^-)"\Sigma^+" \sim 4.8\%$ $d(K^-, n\pi^+)"\Sigma^-" \sim 8.6\%$ average$\sim 4.1\%$
- Scaling factor error

item	ratio	value$\pm$ error
Luminosity	2.6%	$(5.162 \pm 0.014) \times 10^3$
NC efficiency	5.0%	0.291 ± 0.016
intrinsic		0.317 ± 0.016
Overkill$_C VC/BVC$		0.919 ± 0.007
CDC efficiency	0.4%	0.977 ± 0.004
Sum	5.6%	

These analysis details in this link

Horizontal axis difference

(Fitting mean)$-$(PDG value)$\pm$(Fitting error)

$d(K^-, n\pi^+\pi^-)"n"$

mass=938.0 MeV/c^2
σ=12.7 MeV/c^2

diff= $-1.6 \pm 0.1 [MeV/c^2]$

$d(K^-, n\pi^-)"\Sigma^+"$

m=1189.0 [MeV/c^2]
σ=13.0 [MeV/c^2]

diff= $-0.3 \pm 0.2 [Mev/c^2]$

$d(K^-, n\pi^+)"\Sigma^-"$
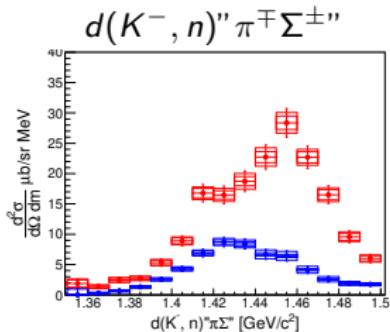
m=1199.3 [MeV/c^2]
σ=13.8 [MeV/c^2]

diff= $1.8 \pm 0.3 [MeV/c^2]$
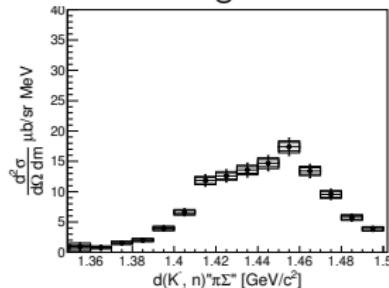
Center and right show histogram subtracted background estimated by template fitting.

Horizontal error is within $2MeV/c^2$.

Vertival error of $d(K^-, n)"\pi^{\mp}\Sigma^{\pm}"$

Inner (thin line) box represents staticial error of $d(K^-, n\pi^+\pi^-)"n"$ events.
Outer (thick line) box represents errors including template fitting ($d(K^-, n\pi^{\mp})"\Sigma^{\pm}"$).
These two errors are different in each bins.
error bar represents errors added convert factor which is common factor in each bins.
These errors was convolved as RMS.

for one's information

Representative value of all errors each spectra
$\rightarrow d(K^-, n\pi^-)"\Sigma^+" \sim 8.6\%$ $d(K^-, n\pi^+)"\Sigma^-" \sim 10.0\%$ average$\sim 8.1\%$