Reconstruction of

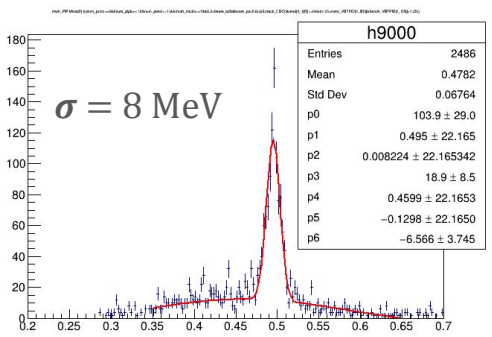
K_s+... and K_s+p

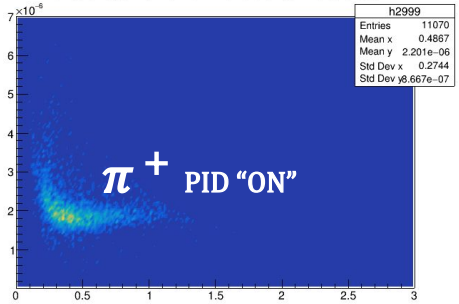
final states from simulated $K_L + p \rightarrow K_s + p$

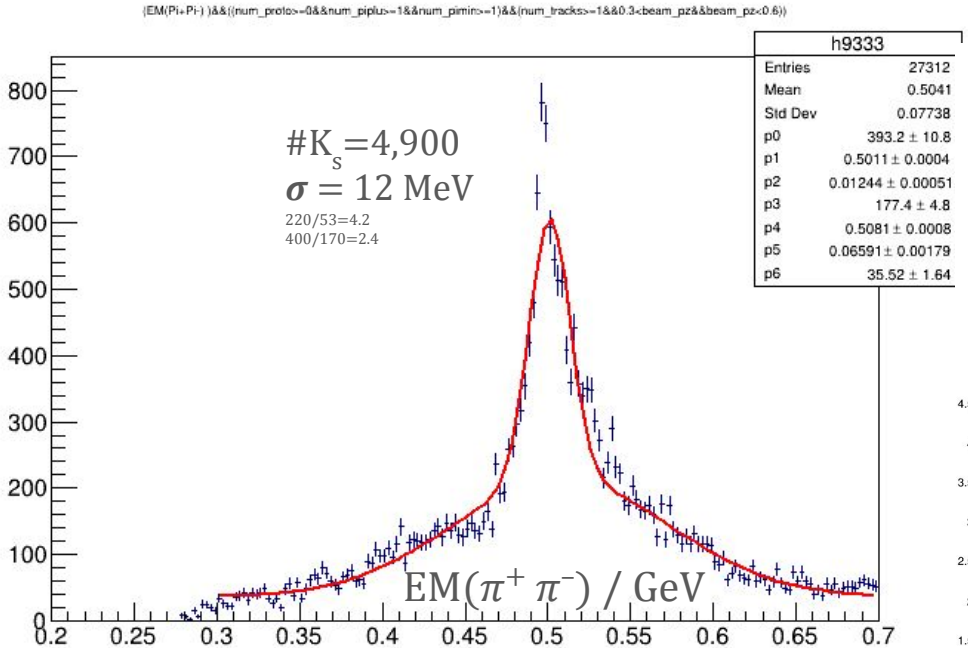
using *positive* and *negative* tracks and dE/dx from CDC.

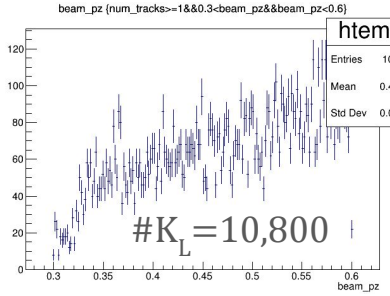
Reconstruction $K_L + p \rightarrow K_s(\pi^+\pi^-) + p$ ... at K_L momentum (0.3,0.6) GeV/c.

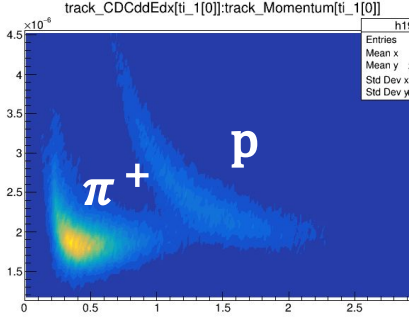
The histogram includes Effective Mass of all x^+x^- pair in each event.







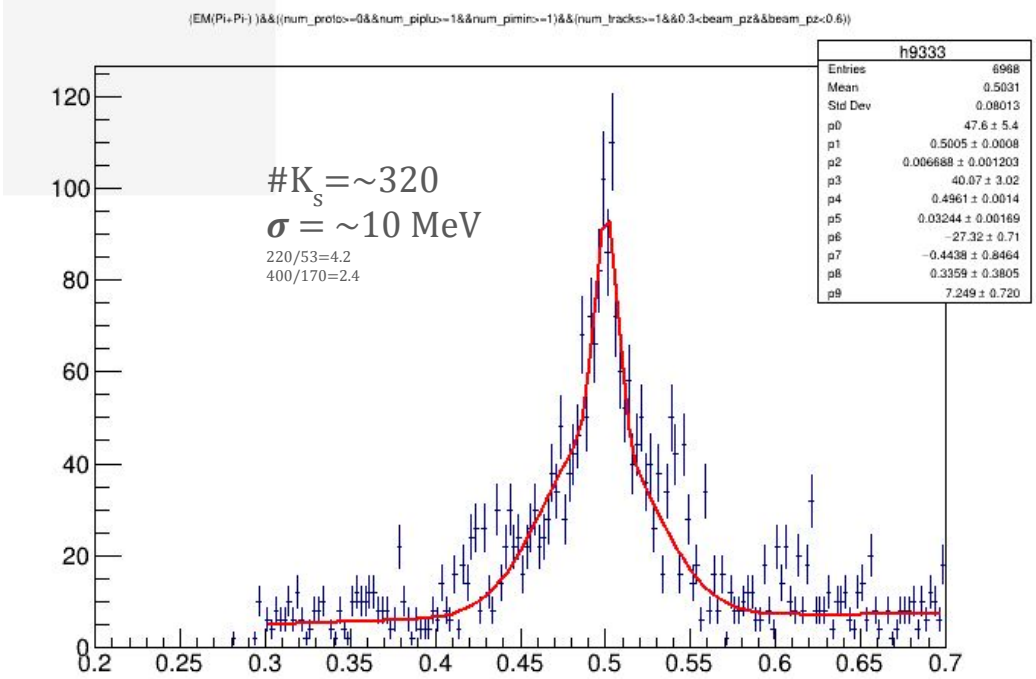


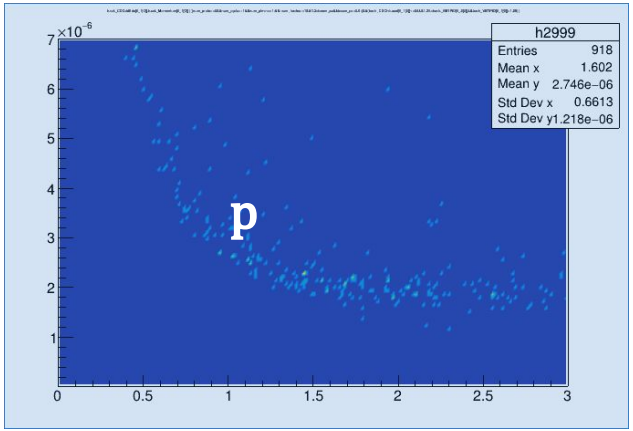


- Reconst. Eff. of K_s via pairs of *positive* & *negative* tracks, and CDC dE/dx : $\varepsilon = 4.9K/10.8K = \mathbf{45\%}$.
- Combinatorial background is twice higher. Interesting to compare with 12C(γ, K0).

Reconstruction $K_L + p \rightarrow K_s(\pi^+\pi^-) + p$ ... at K_L momentum (0.3,0.6) GeV/c.

The histogram includes Effective Mass of all x^+x^- pair in each event.



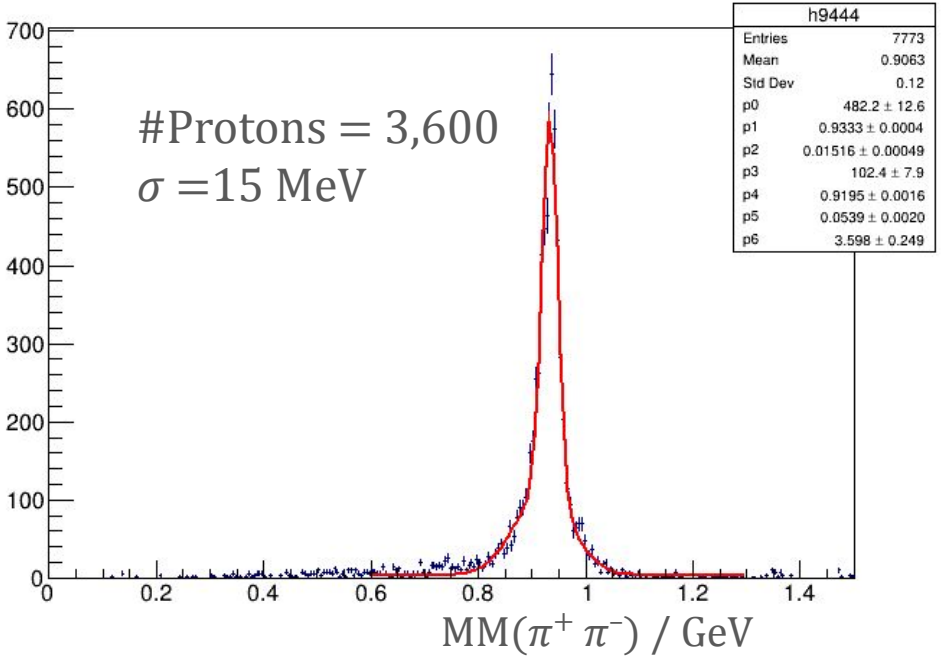


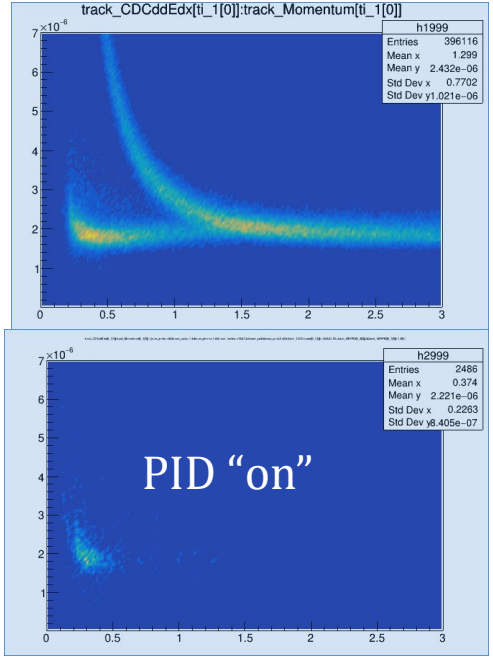
- Rec. Eff. of K_s via pairs of positive & negative tracks, and inverse CDC dE/dx : ε =0.32K/10.8K = **3%.**

Reconstruction $K_L + p \rightarrow K_s(x^+x^-) + p$ at K_L momentum (0.3,0.6) GeV/c.

The histogram includes Effective Mass of all x^+x^- pair in each event.

Common Cut: num_proto>=0 & num_piplu>=1 & num_pimin>=1 & num_tracks>=1 & 0.3<beam_pz<0.6)
Track ID Cut: track_CDChitused[ti_1[0]]>=4 & 1.25>track_VBTPID[ti_2[0]] & track_VBTPID[ti_1[0]]<1.25

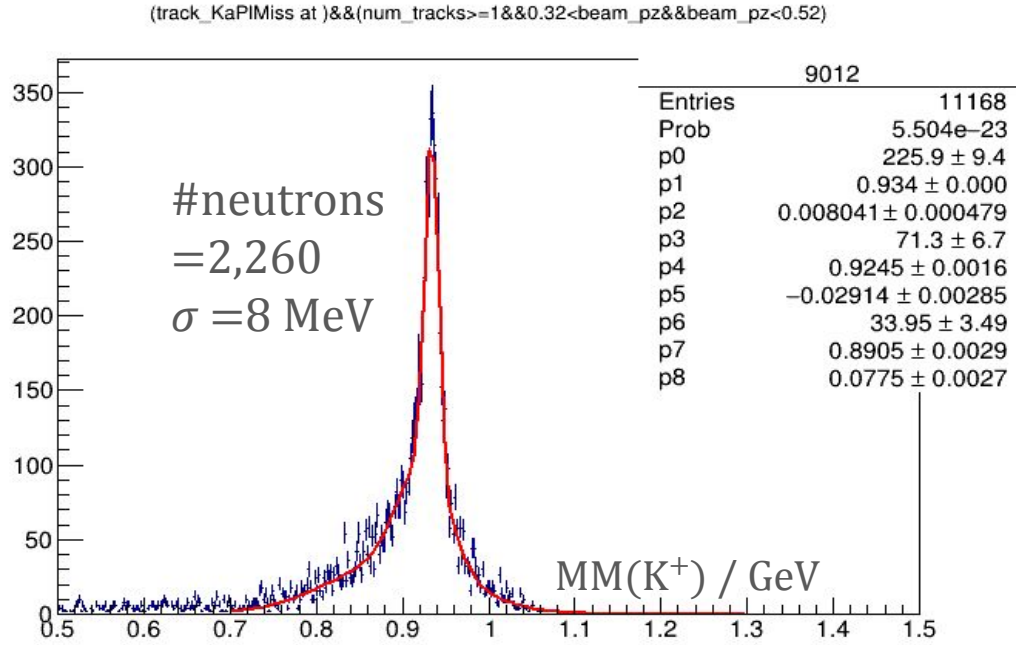


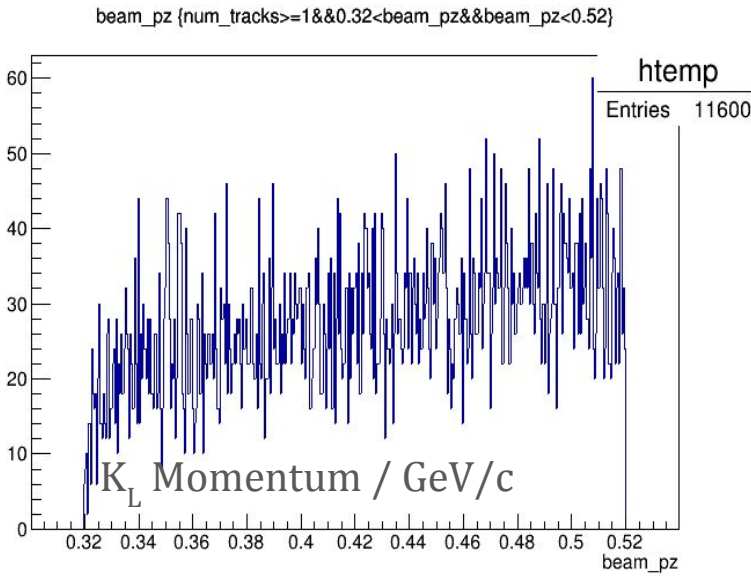


- Reconst. Eff. of $K_s + p$ via pairs of positive & negative tracks, and CDC dE/dx : $\varepsilon > 3.6\text{K}/10.8\text{K} = 33\%$!

Reconstruction Eff. of $K_L + p \rightarrow K^+ + n$ at K_L momentum (.32, 0.52) GeV/c.

The histogram includes Missing Masses of all K^+.





- Gaussian-1 S_1=p0[1/ch]*$\sqrt{2\pi}$*p2[GeV]* [ch/GeV]=226*2.5*0.008*500=2260
- Gaussian-2 S_2=p3[1/ch]*$\sqrt{2\pi}$*p5[GeV] *[ch/GeV]= 71*2.5*0.029*500=2660
- **In 5q region** Reconstruction Efficiency =2260/11600 =~**20%** (~40% with two Gaussians).

Photo-production of neutral kaons on 12C in the threshold region

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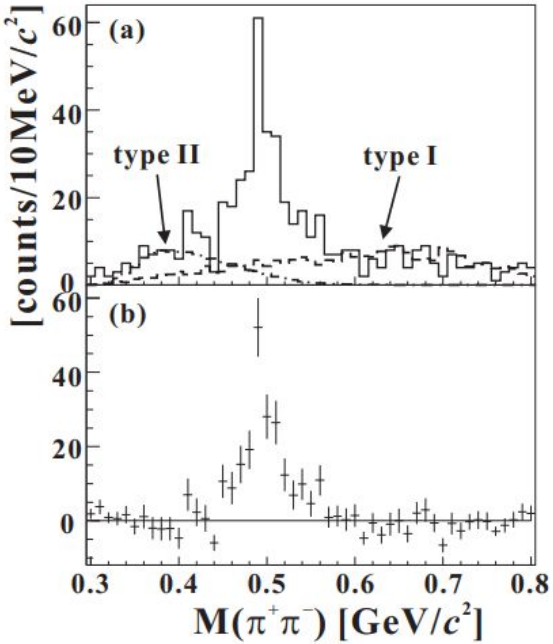


Fig. 4. Invariant mass spectra without (a) and with (b) the estimated background subtraction. In (a), solid, dashed and dot-dashed lines are raw, type(I) background and type(II) background, respectively. The data is of $1.05 < E_\gamma < 1.10$ and $0.9 < \cos\theta_{K0} < 1.0$.

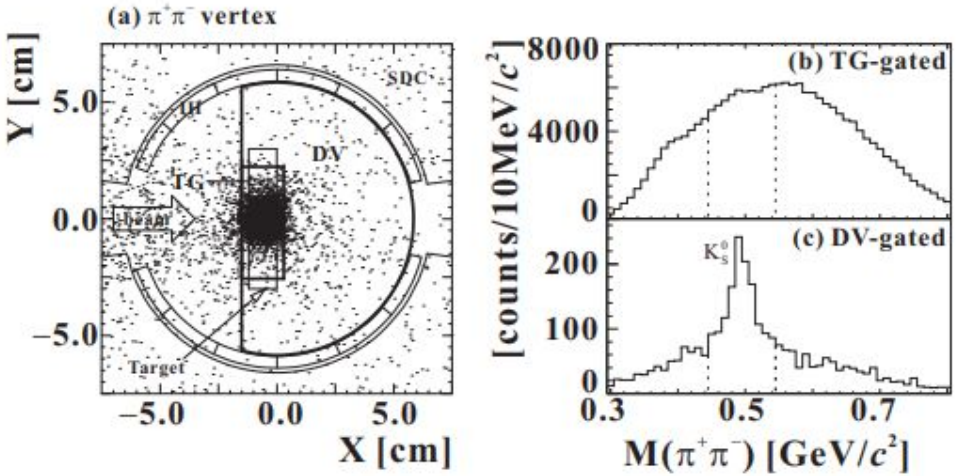
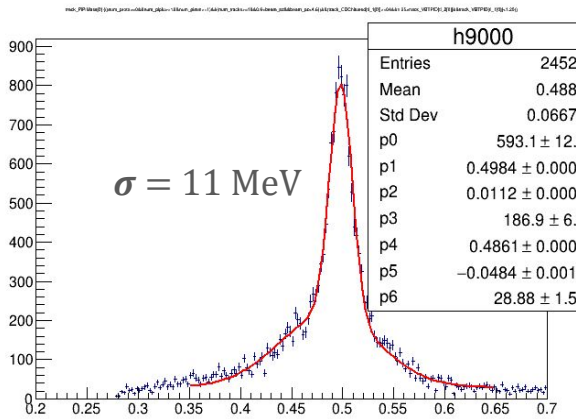
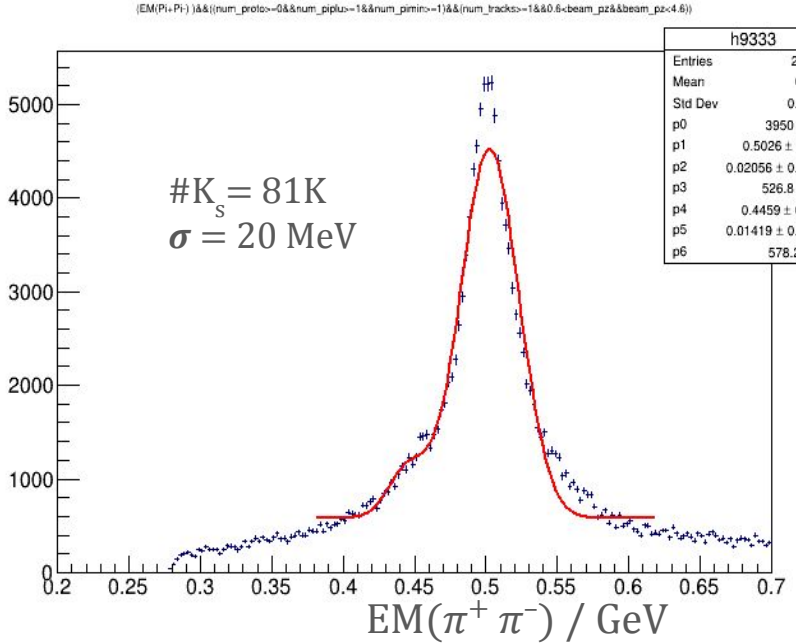


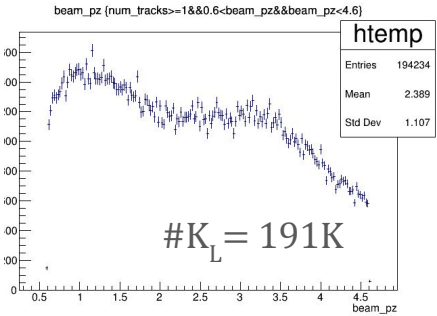
Fig. 2. (a) A vertex distribution of $\pi^+\pi^-$ events. The figure are a top view of the target area. Beam comes from left to right (X-axis). The Y-axis means horizontal direction perpendicular to the beam. Events come mainly from the target region denoted by TG. (b) An invariant mass spectrum of $\pi^+\pi^-$ events gated that the vertex is in the target region (TG-gated). (c) An invariant mass spectrum of $\pi^+\pi^-$ events gated that the vertex is outside the target denoted by DV. The peak around $M = 493$ MeV is identified as K^0_S.

Reconstruction $K_L + p \rightarrow K_s(x^+x^-) + \ldots$ at K_L momentum (0.6,4.6) GeV/c.

The histogram includes Effective Mass of all x^+x^- pair in each event.







- Reconstruction efficiency of K_s via pairs of positive and negative tracks and CDC dE/dx is $\varepsilon = 81K/191K = 42\%$.

Common Cut: (num_proto>=0&&num_piplu>=1&&num_pimin>=1)&&(num_tracks>=1&&0.3<beam_pz&&beam_pz<0.6)
Track ID Cut: track_CDChitused[ti_1[0]]>=04&&1.25>track_VBTPID[ti_2[0]]&&track_VBTPID[ti_1[0]]<1.25

Conclusive remarks

- Reconstruction efficiency of K_s And K_s+p is sufficiently high.
- It may be affected by neutron induced reactions.
- We need to simulate all background reactions.
- How to use beam TOF