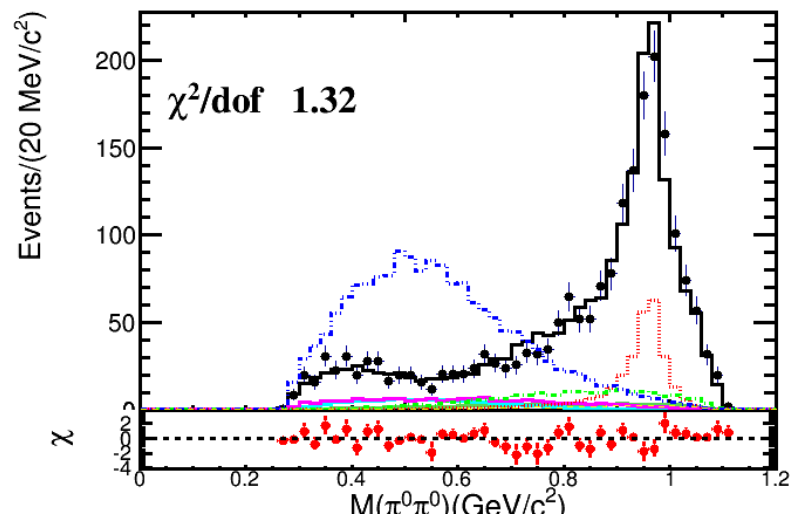
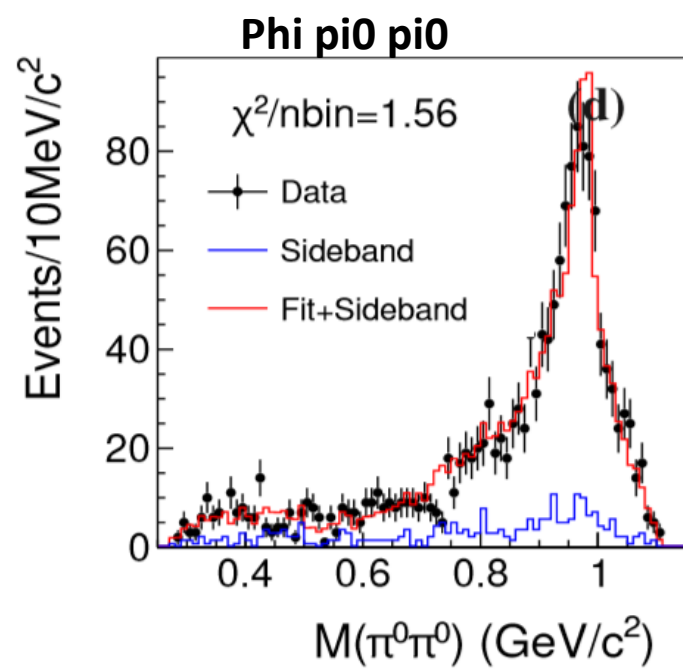
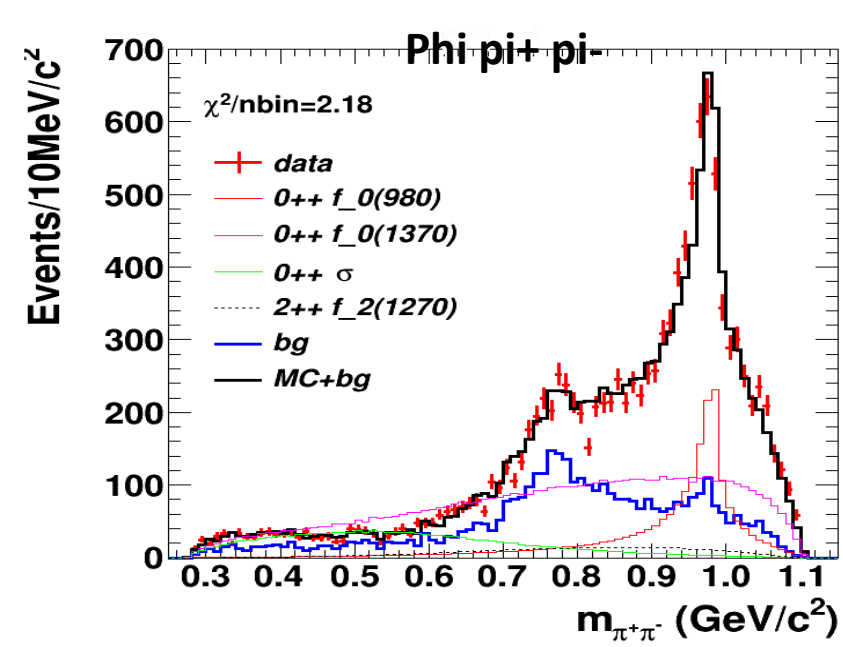




Consider phi f0(980), phi f0(1370), phi sigma,
phi f2(1270), phi pi0 pi0

PWA of $e^+e^- \rightarrow K^+K^-\pi^0\pi^0$

Yateng Zhang

University of Science and Technology of China

Φ +anything $\Phi\sigma$ $\Phi f_0(980)$ $\Phi f_0(1370)$ $\Phi f_2(1270)$ $\Phi\pi^0\pi^0$ $\Phi(1600)\pi^0$ $K^{*+}K^{*-}$ $K^{*\pm}K^{\mp}\pi^0$ $K^*(1410)K$ $K_1(1400)K$ $K_1(1270)K$ ($K_1(1270)\rightarrow K^*(892)\pi$) $K_1(1270)K$ ($K_1(1270)\rightarrow K^*(1430)\pi$) $K^{*+}_0(1430)K^{*-}$ $K^{*+}_2(1430)K^{*-}$ ($|23\rangle$ $|43\rangle$) K^{*}_2K ($K^{*}_2\rightarrow K^*\pi^0$) $K^{*\pm}_2K^{\mp}\pi^0$ $K^{*\pm}_0K^{\mp}\pi^0$ **$R(\pi^0\pi^0)+K^+K^-$** $K^+K^-f_0(980)$ $K^+K^-\sigma$ $K^+K^-f_0(1370)$ $K^+K^-f_2(1270)$ **PHSP** $K^+K^-\pi^0\pi^0$ **Phi mass window region:** **$|M(KpKm)-1.02|<0.02$ GeV**

Background control sample

$K_S K \pi \pi^0$, $K_S \rightarrow \pi^+ \pi^-$ control sample data

MC:

K11270K

K11410K

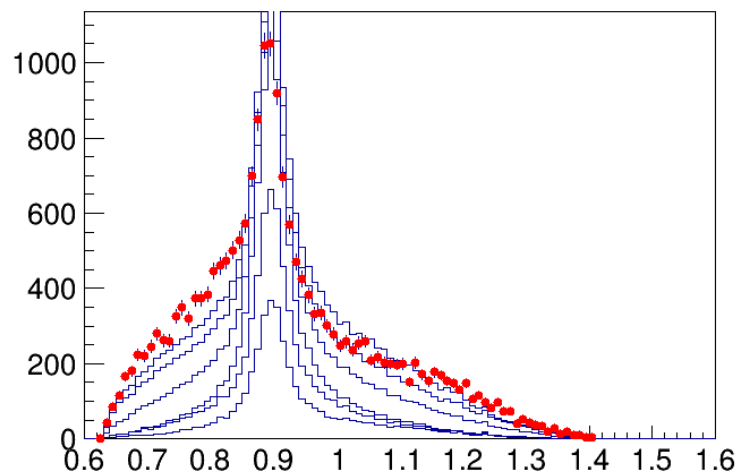
KstarKpi

KstarKpi0

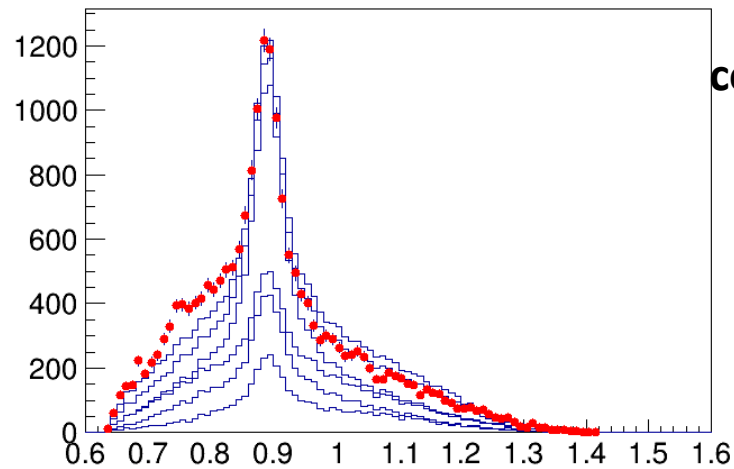
KstarKspi

KstarKspi0

mkspi0

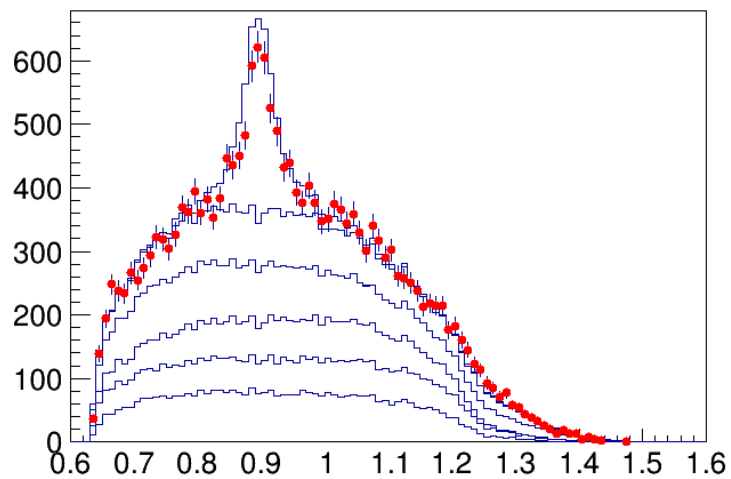


mkspi

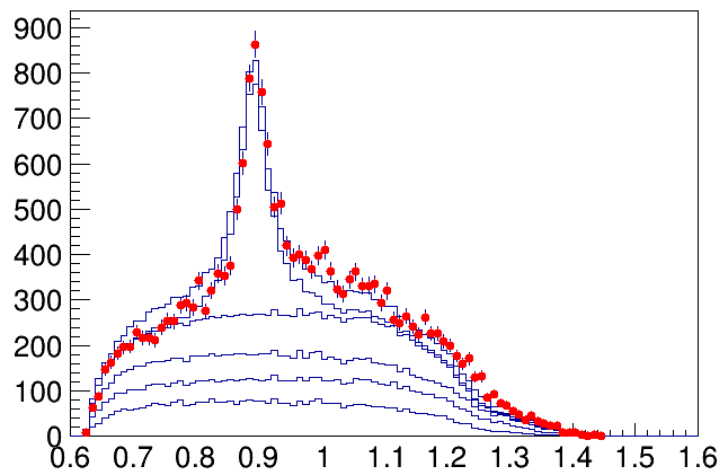


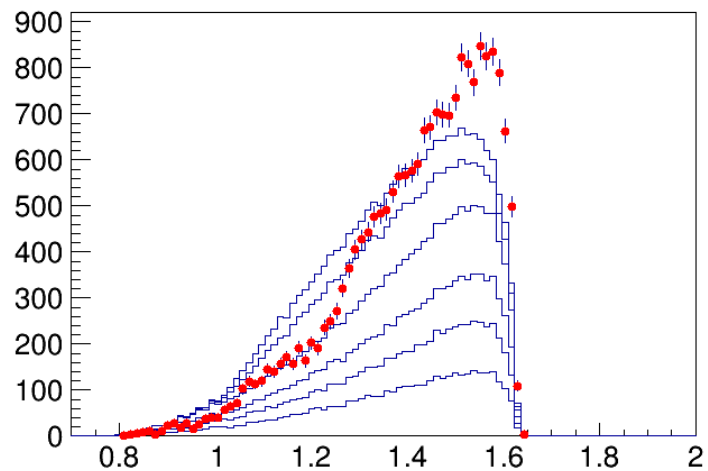
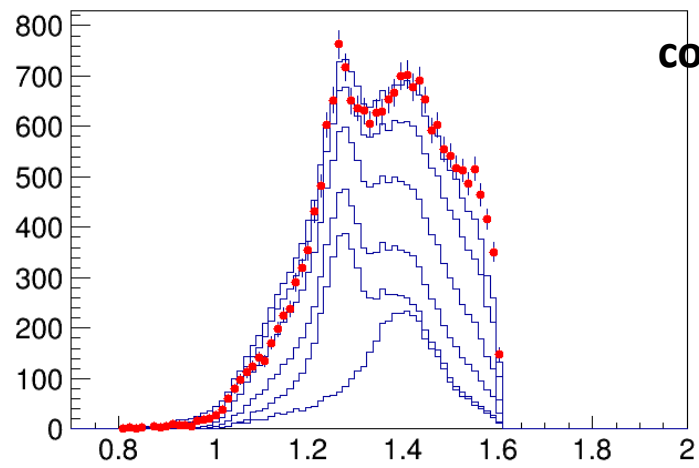
control sample

mkpi



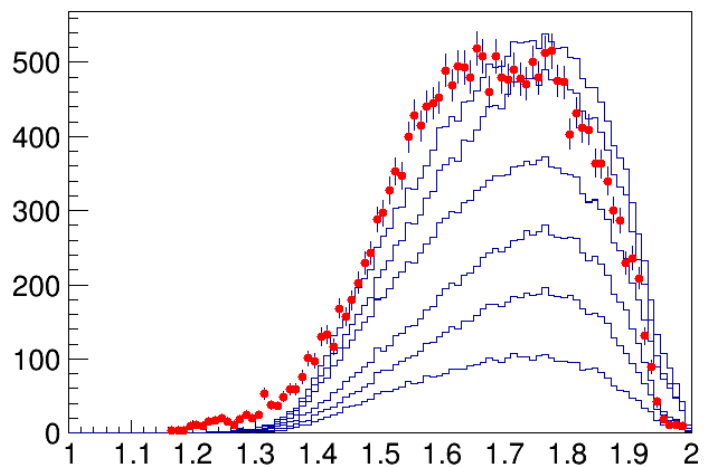
mkpi0



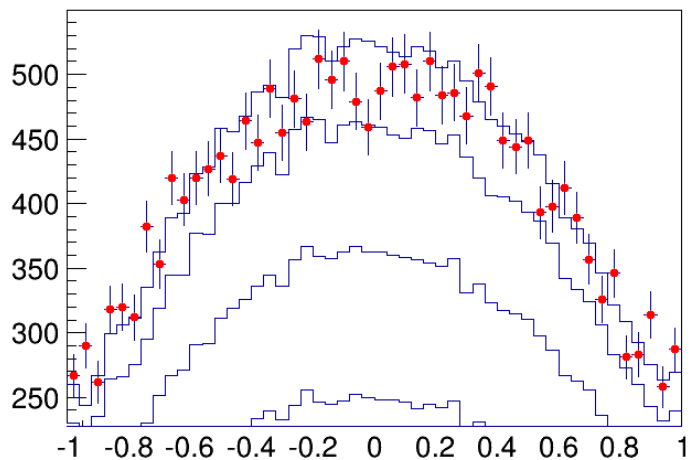
mkp*ipi*0hmksp*ipi*0

control sample

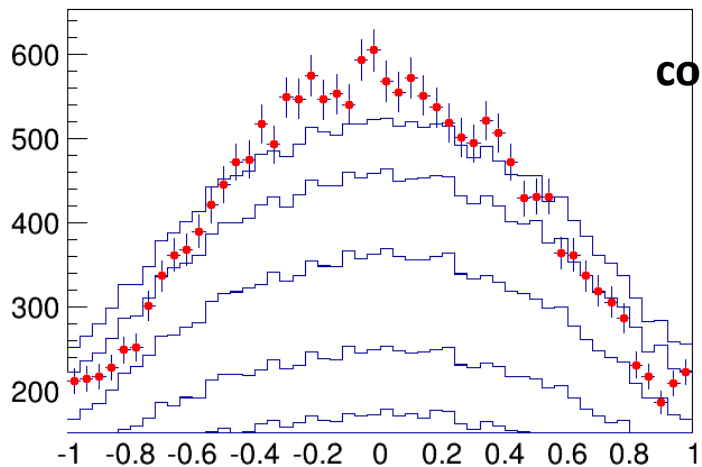
hmkskpi



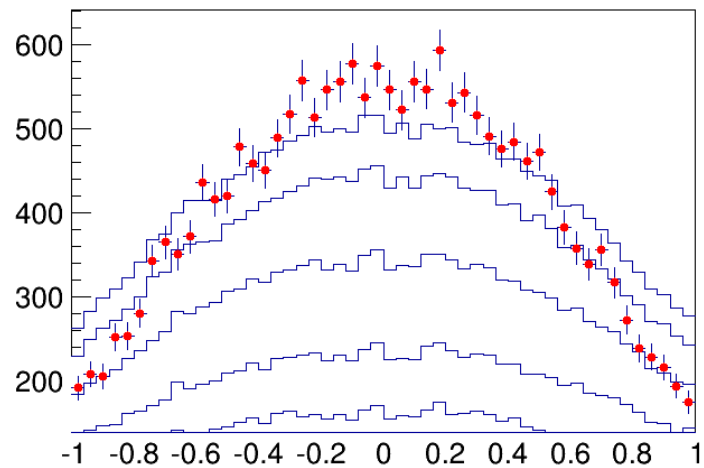
cos_ksk



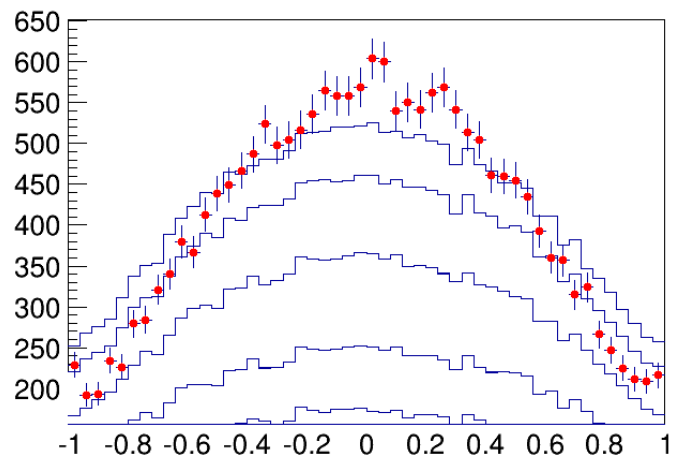
cos_kspi0

**control sample**

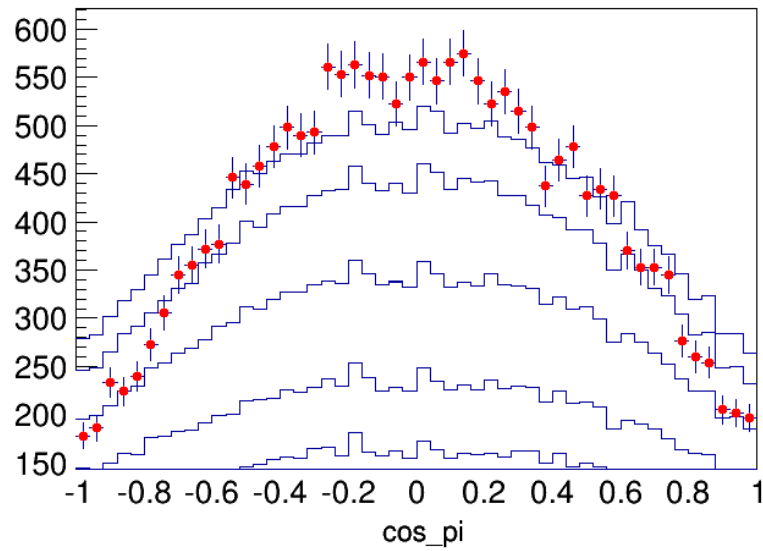
cos_kspi



cos_kpi

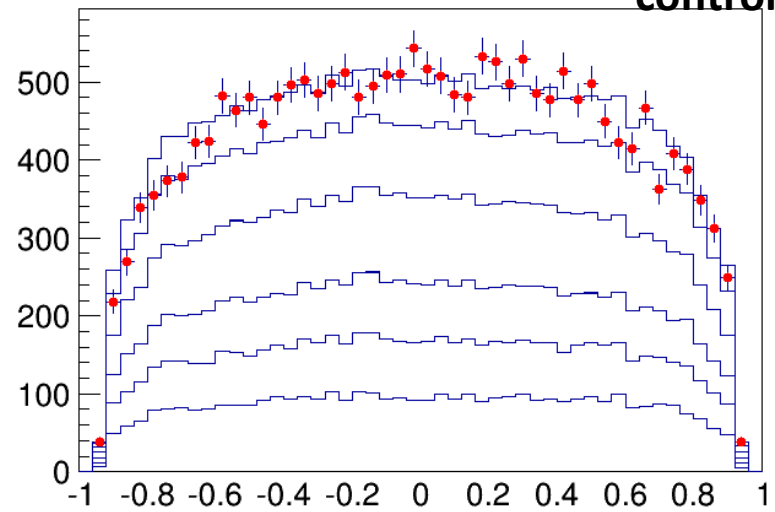


cos_kpi0

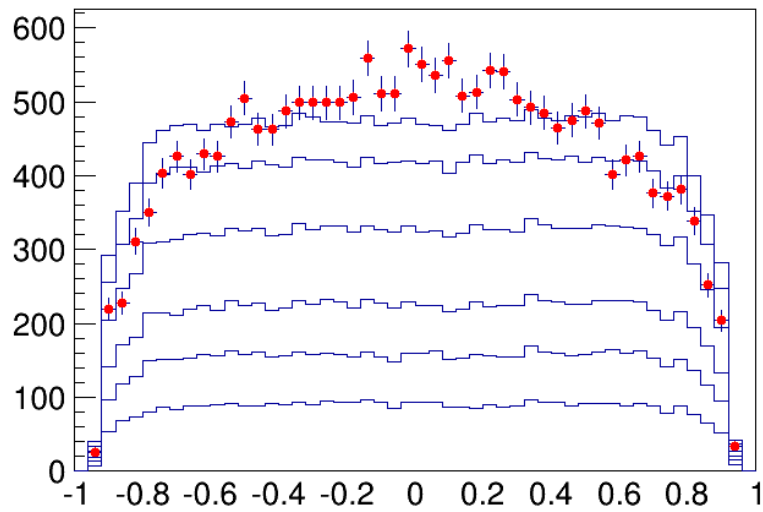


cos_k

control sample

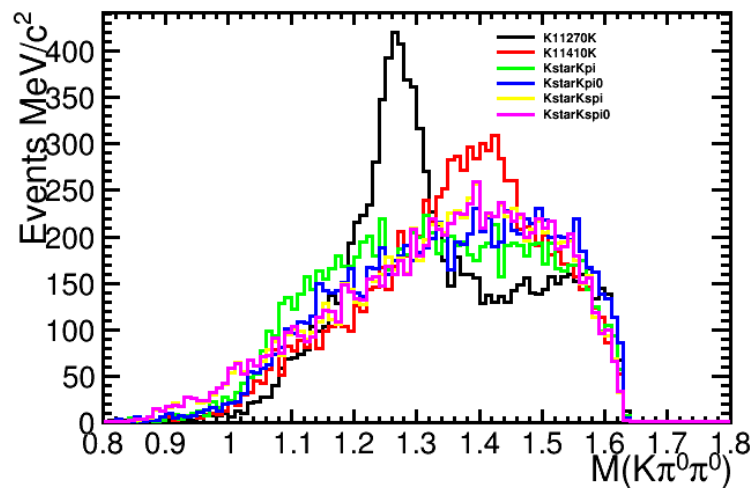
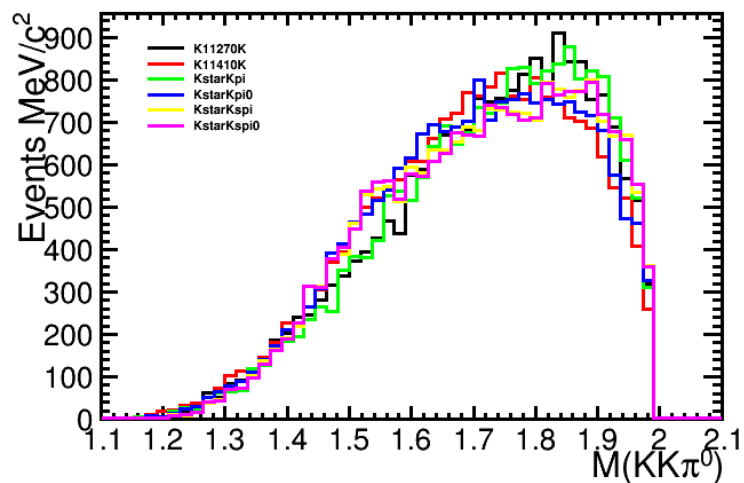
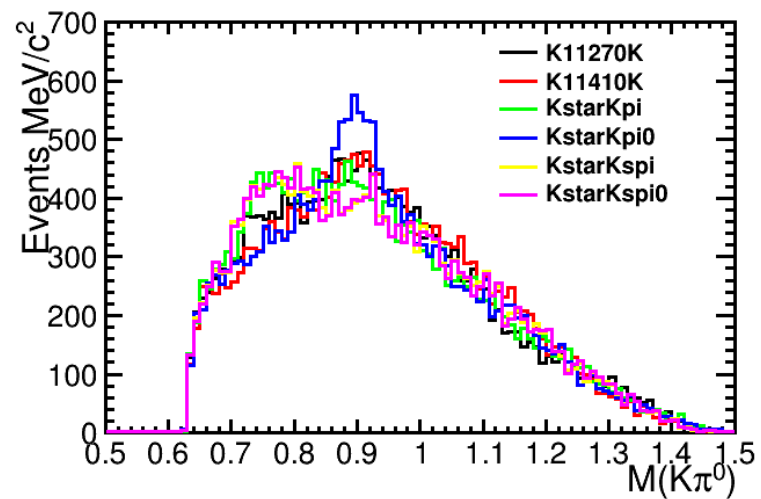
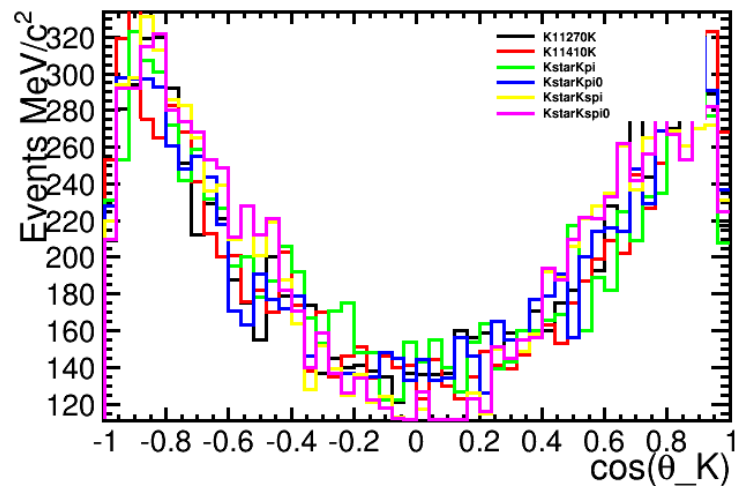


cos_pi



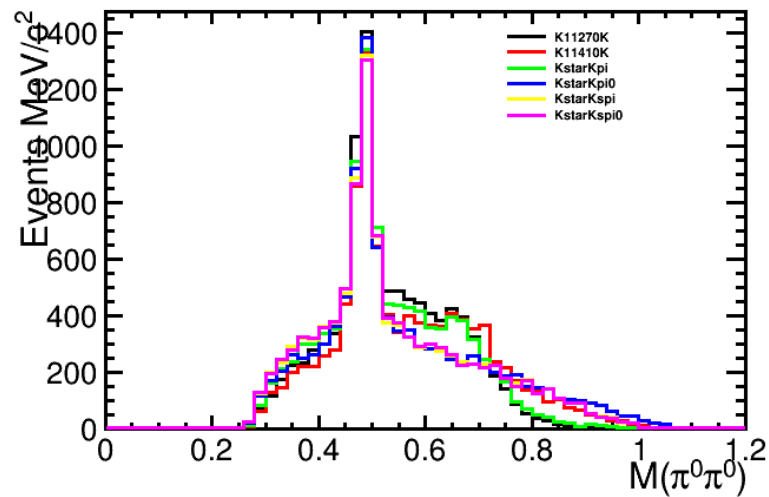
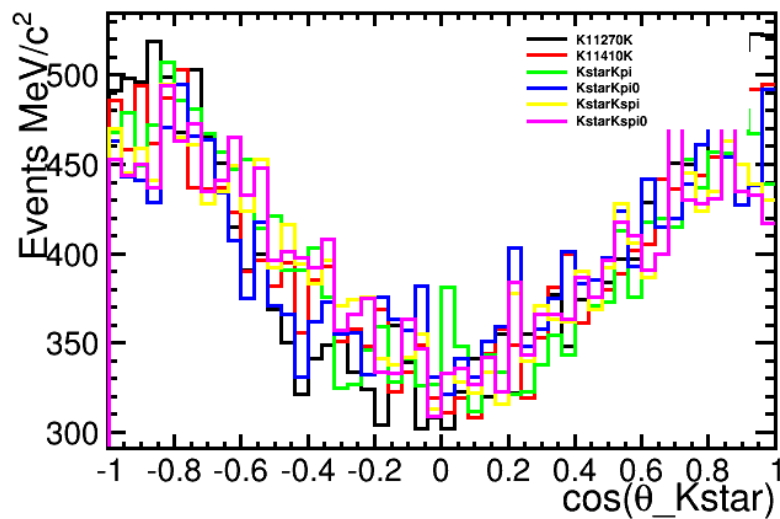
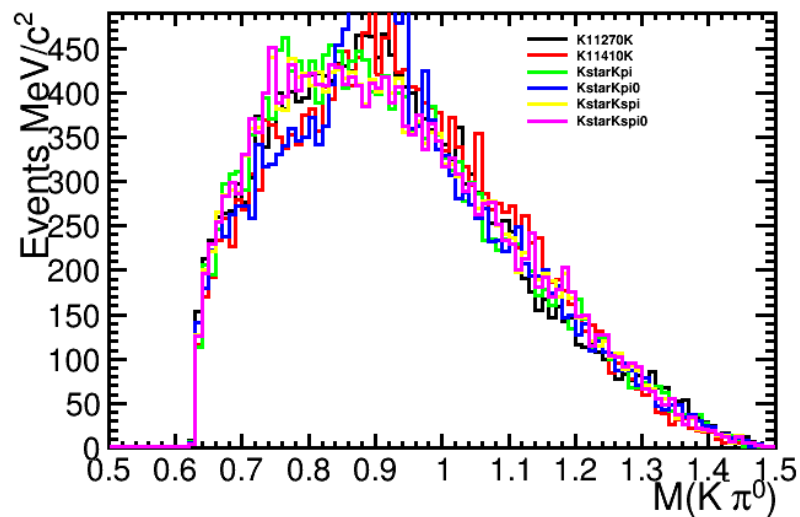
Signal Selection

$K_S K \pi \pi^0$, $K_S \rightarrow \pi^0 \pi^0$



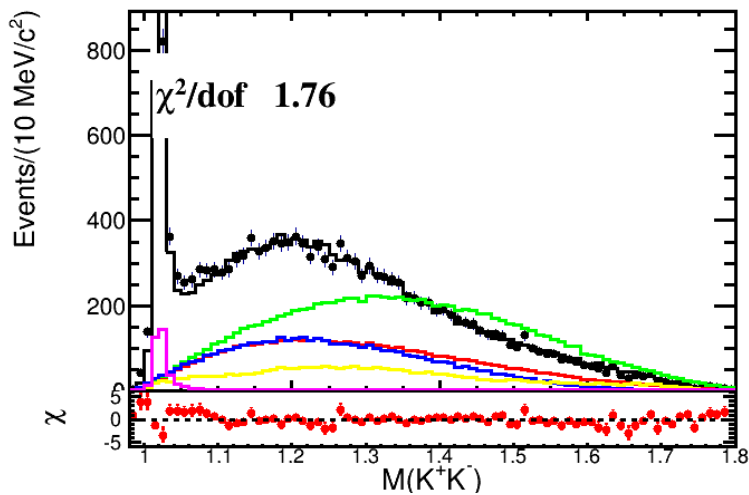
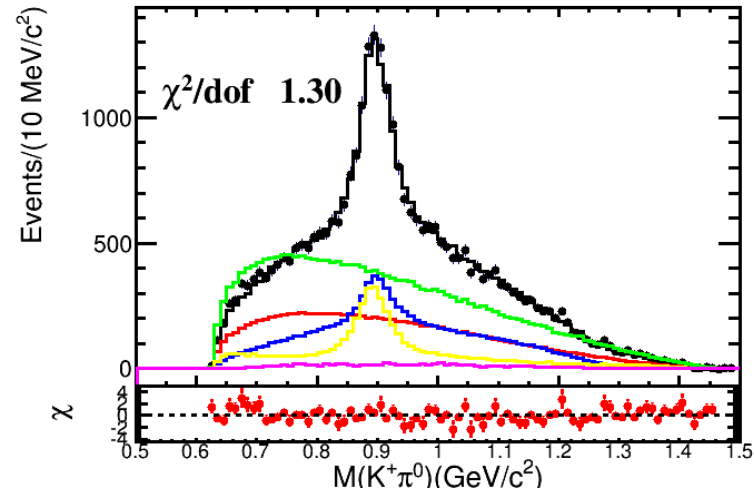
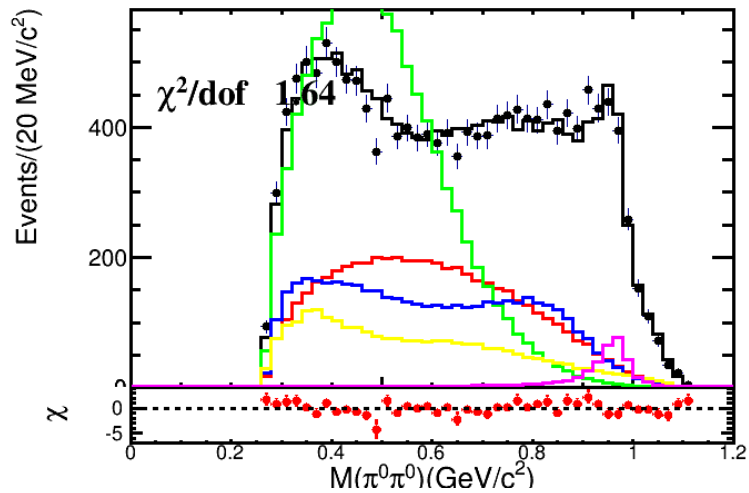
Signal Selection

$K_S K \pi \pi^0$, $K_S \rightarrow \pi^0 \pi^0$

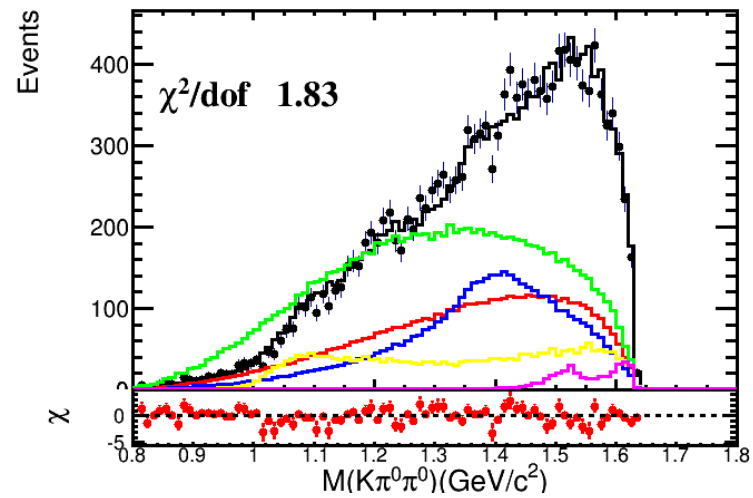
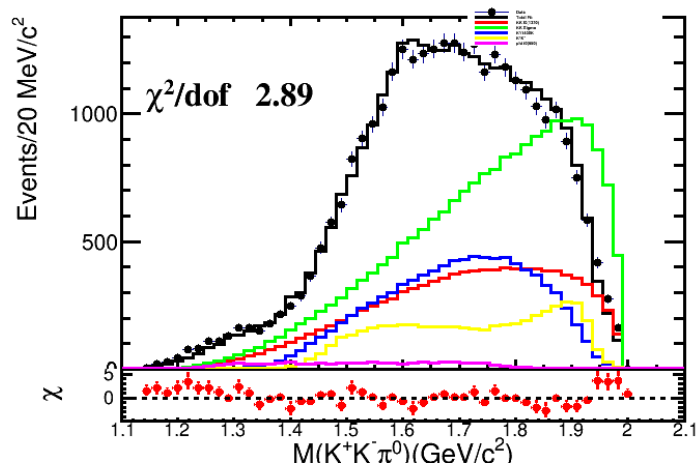


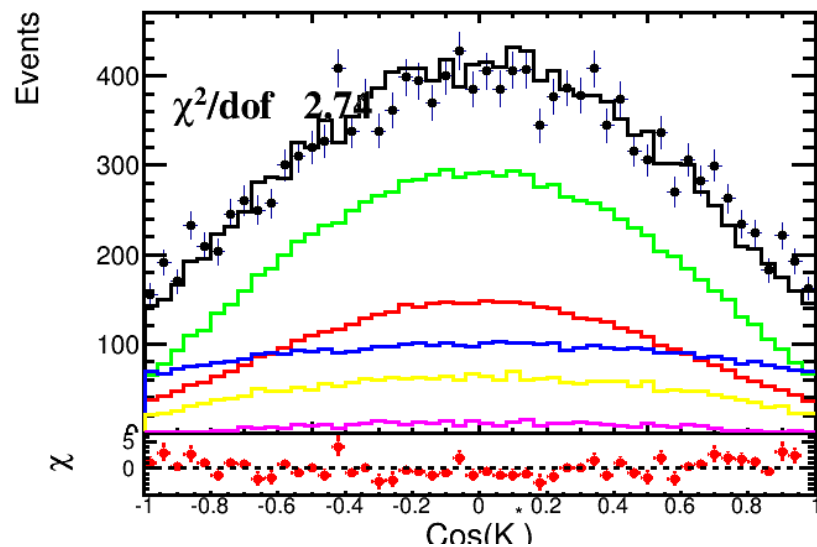
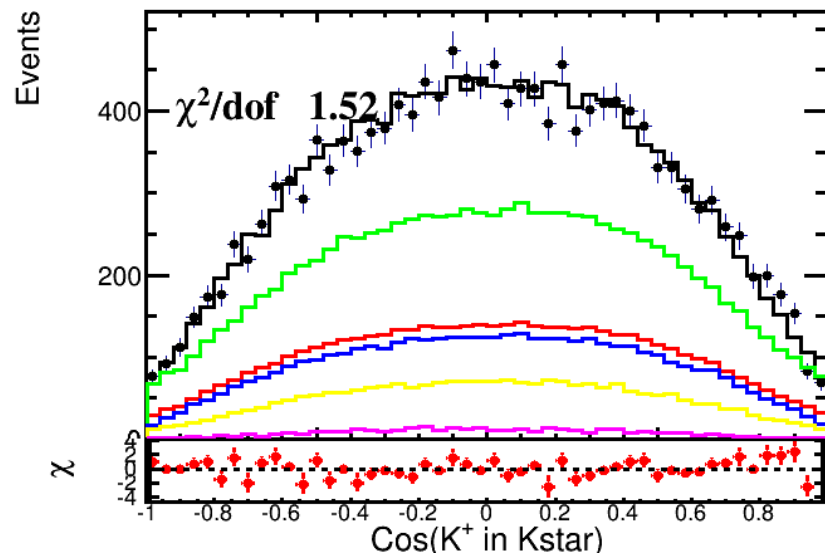
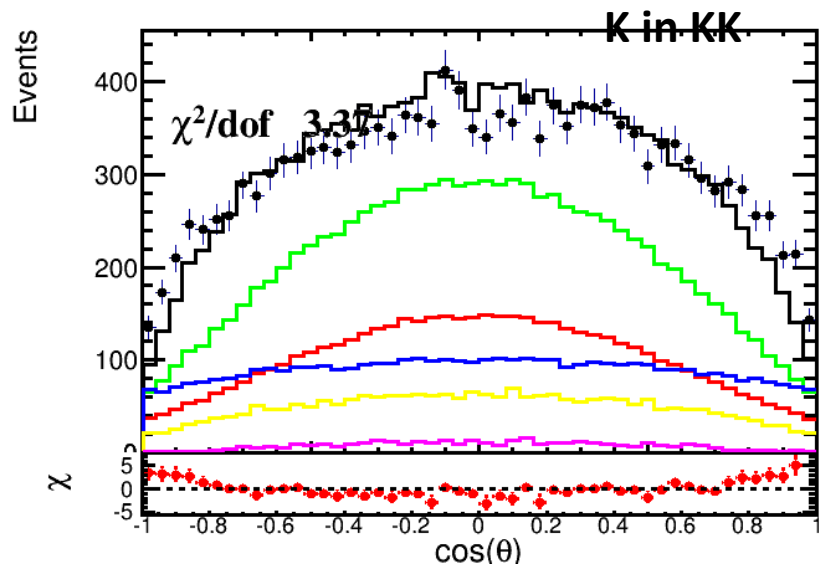
Fitting results

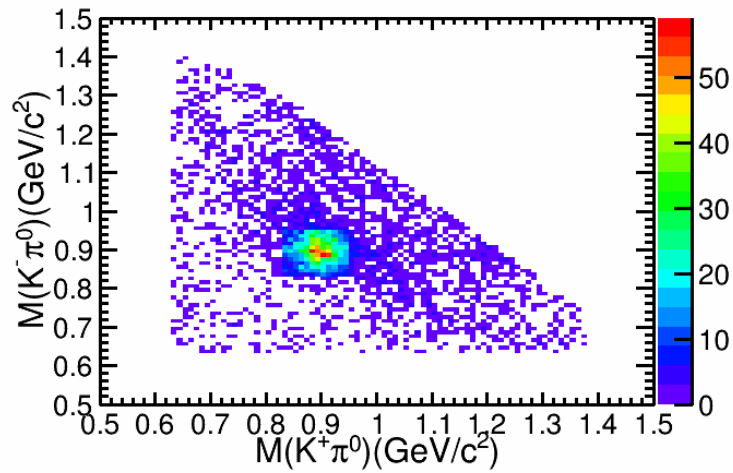
Remove Background contribution



- Data
- Total Fit
- KK f0(1370)
- KK Sigma
- K11400K
- K*K*
- phi f0(980)





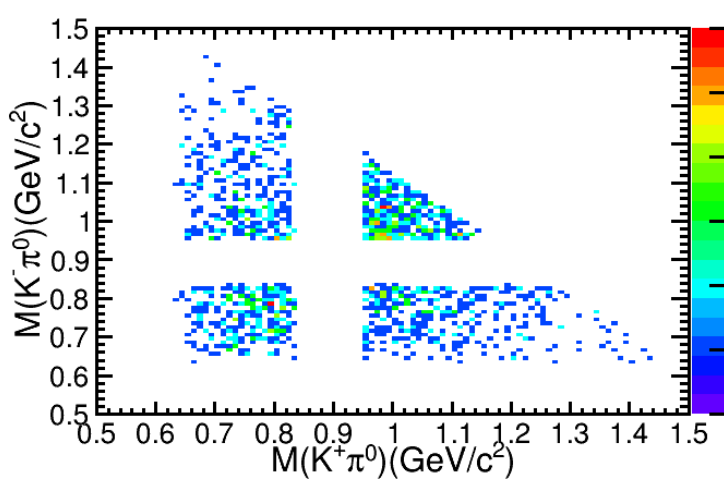


Region 1

$$\begin{aligned} & |K^+\pi_1 - 0.892| < 0.08 \text{ GeV} \ \&\& \ |K^-\pi_2 - 0.892| < 0.08 \text{ GeV} \\ \text{or} \quad & |K^+\pi_2 - 0.892| < 0.08 \text{ GeV} \ \&\& \ |K^-\pi_1 - 0.892| < 0.08 \text{ GeV} \end{aligned}$$

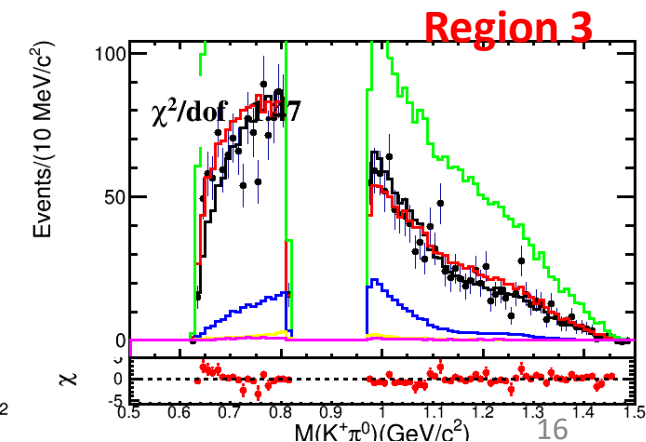
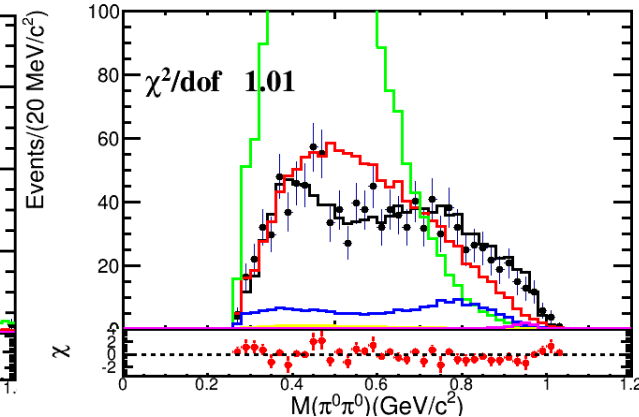
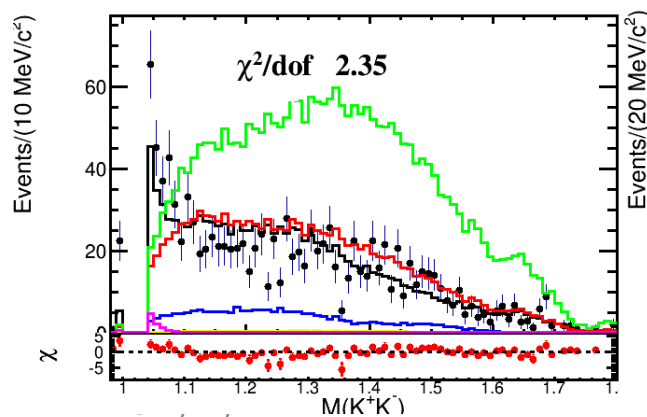
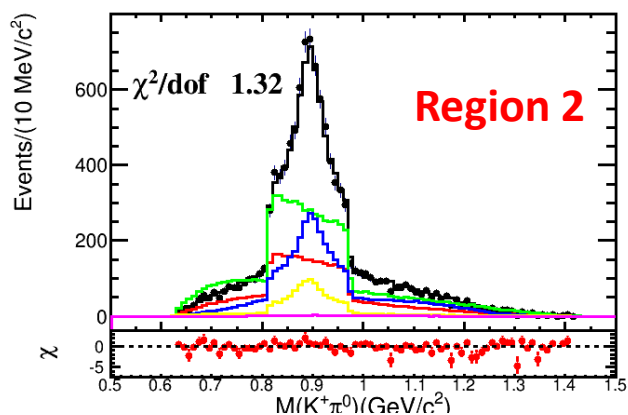
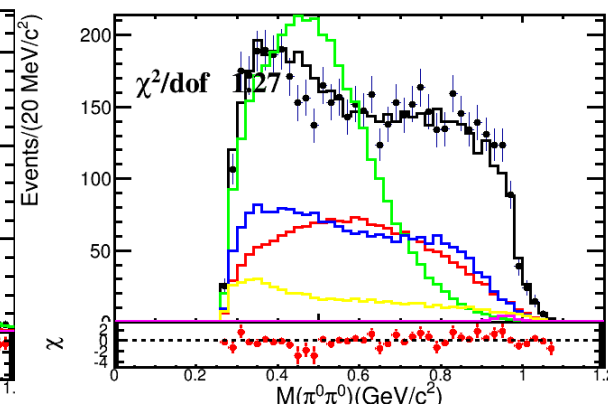
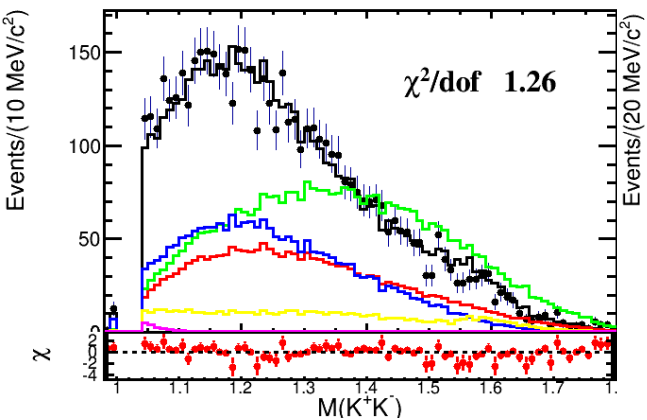
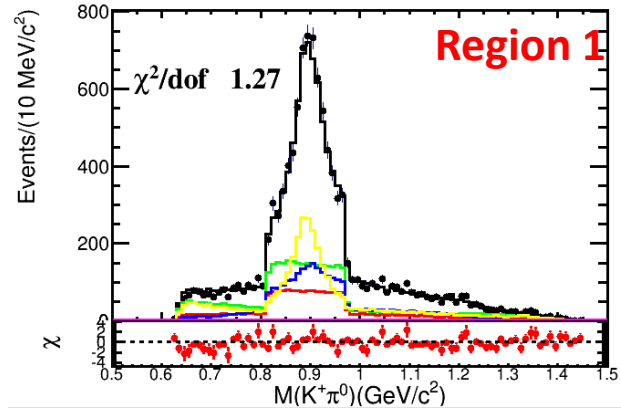
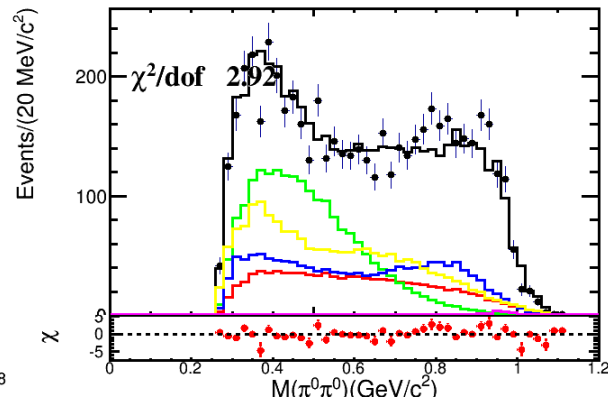
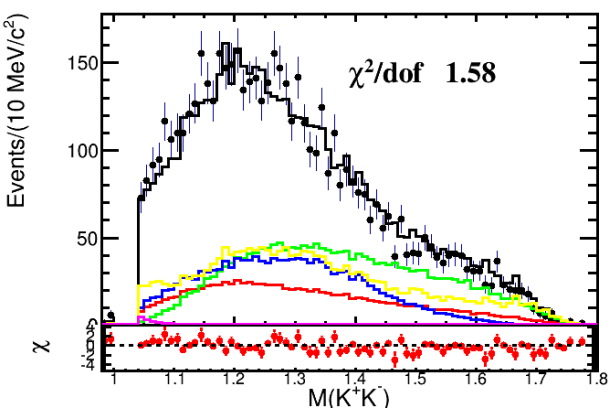
Region 2

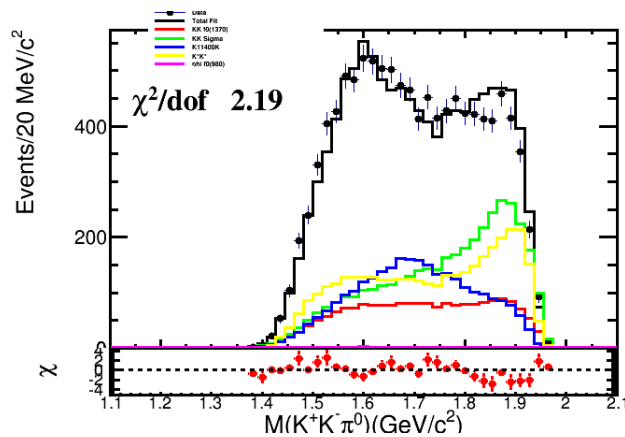
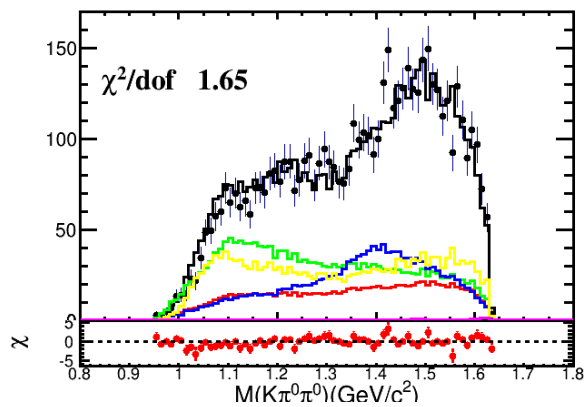
$$|K^+\pi_1 - 0.892| < 0.08 \text{ GeV} \ \&\& \ |K^-\pi_2 - 0.892| > 0.08 \text{ GeV}$$



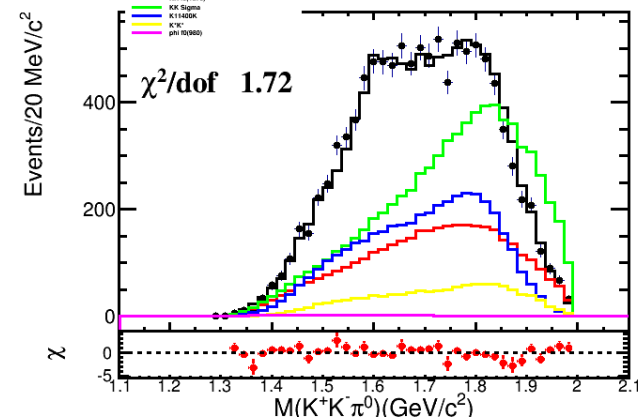
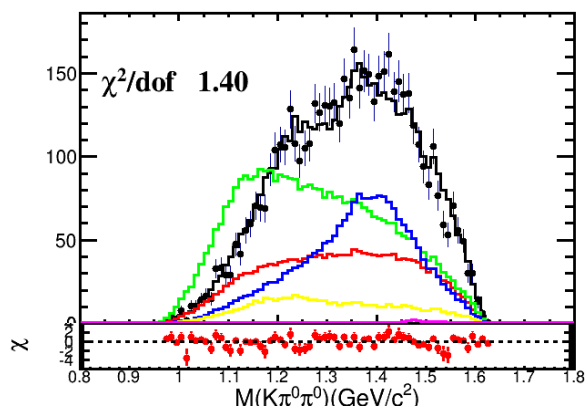
Region 3

$$\begin{aligned} & !(|K^+\pi_1 - 0.892| < 0.08 \text{ GeV} \ || \ |K^-\pi_2 - 0.892| < 0.08 \text{ GeV} \\ & || \ |K^+\pi_2 - 0.892| < 0.08 \text{ GeV} \ || \ |K^-\pi_1 - 0.892| < 0.08 \text{ GeV} \end{aligned}$$

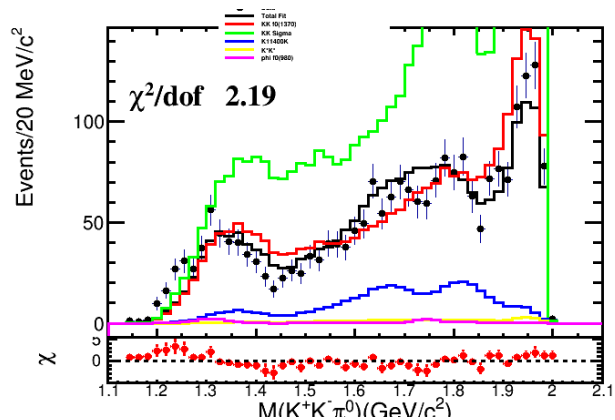
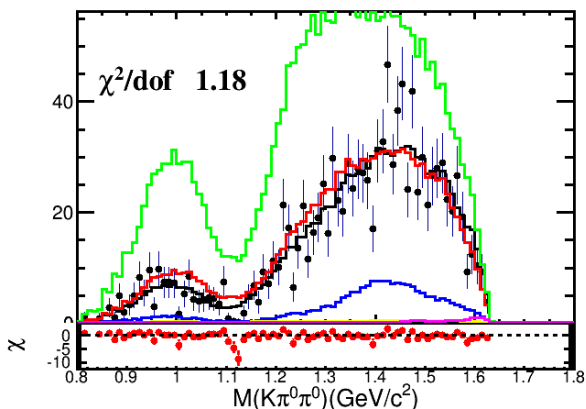




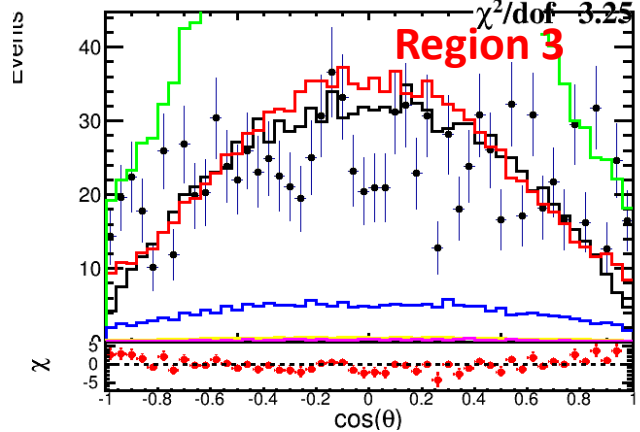
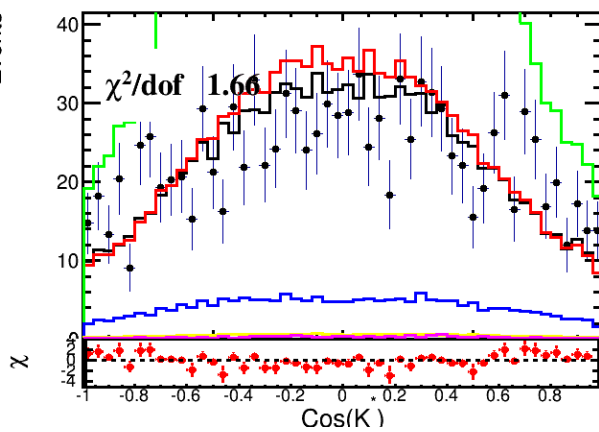
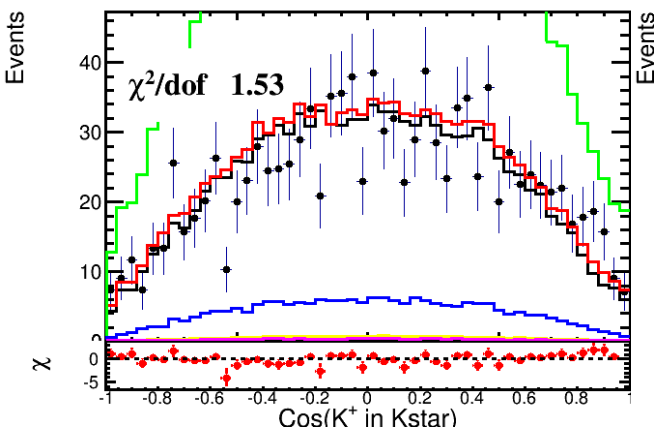
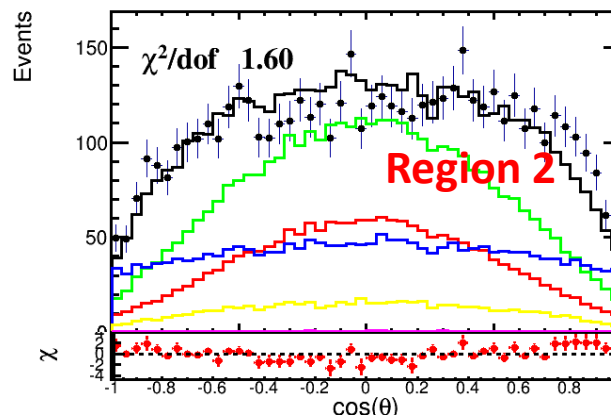
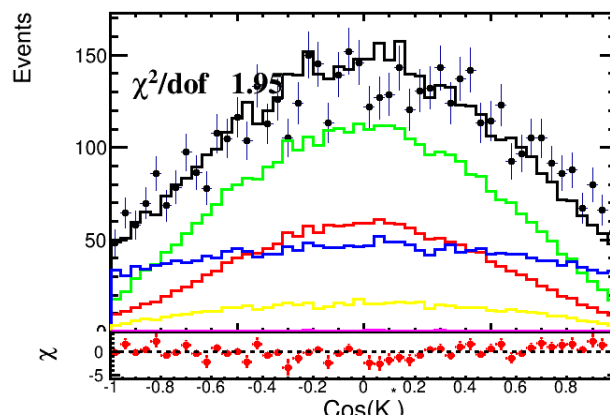
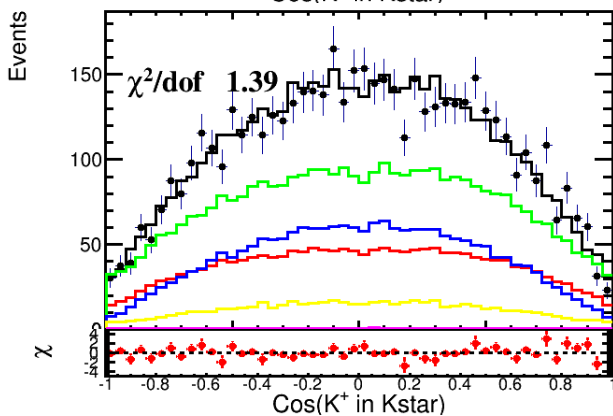
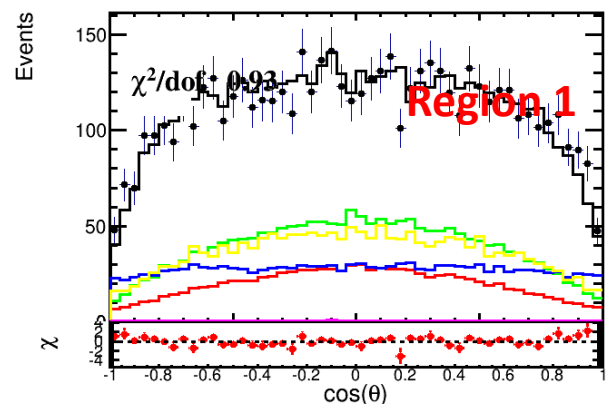
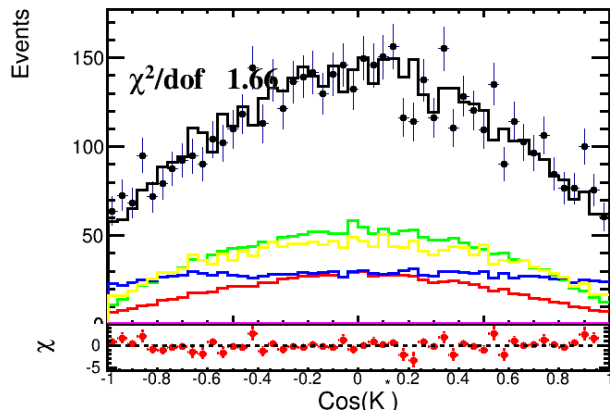
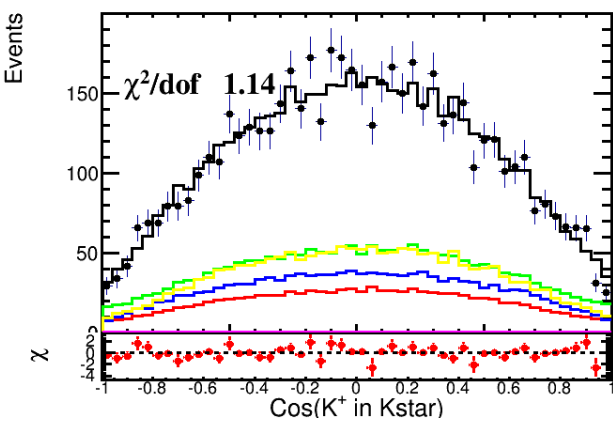
Region 1



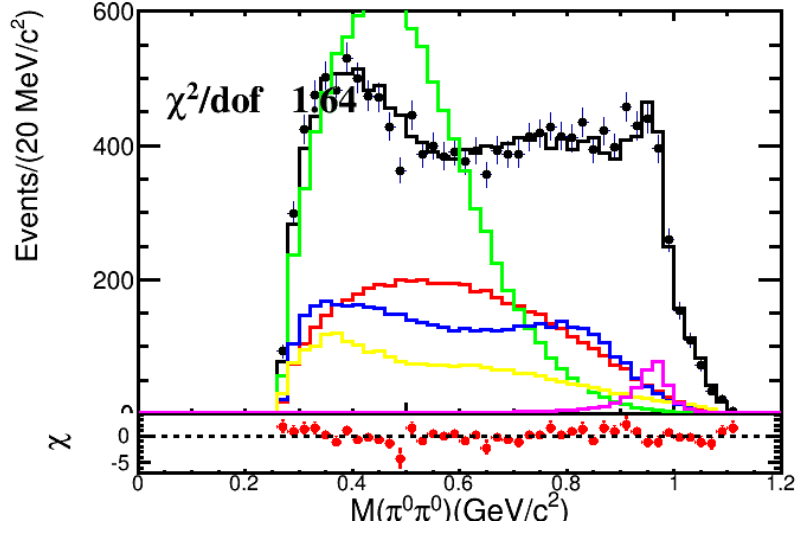
Region 2



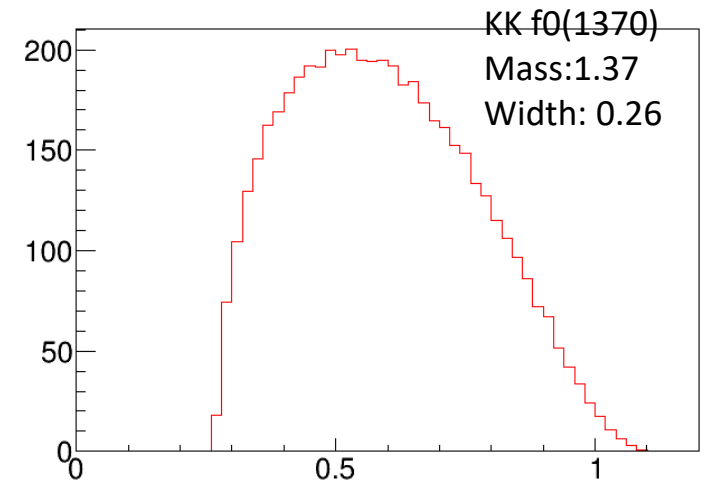
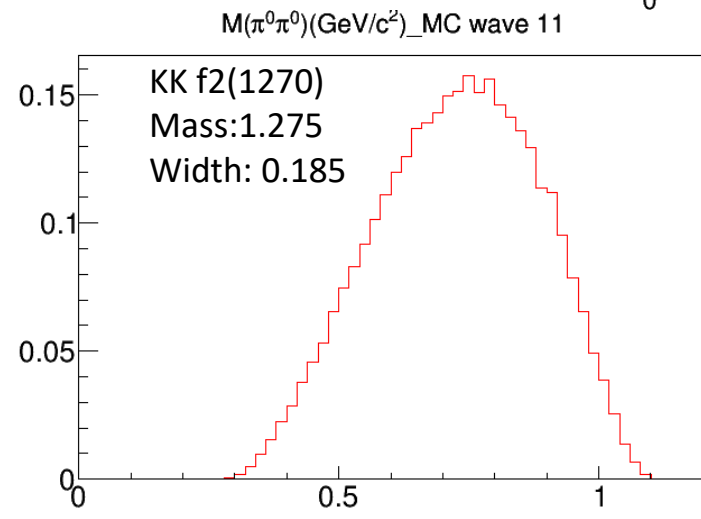
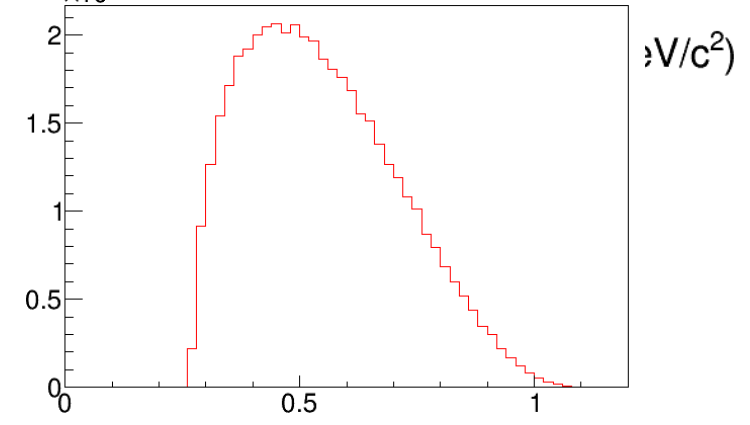
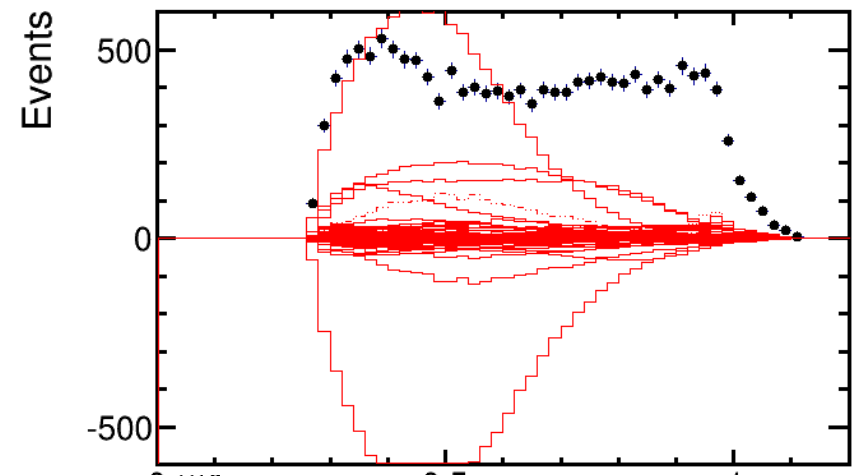
Region 3

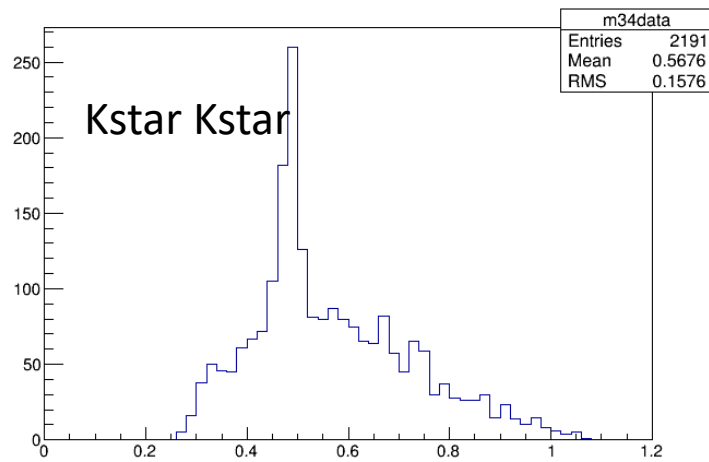
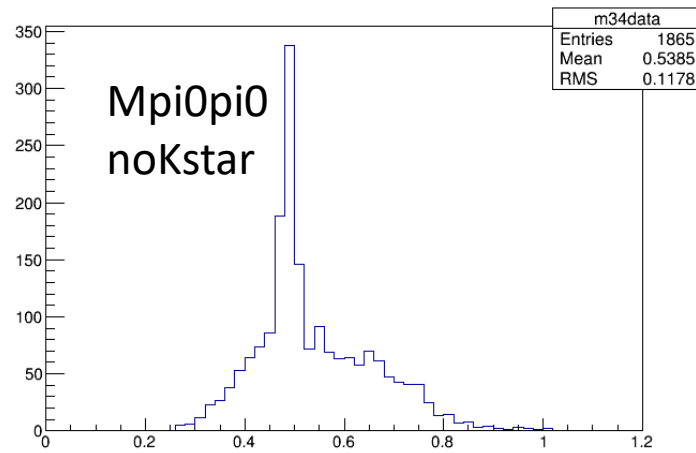


backup



- Data
- Total Fit
- KK f0(1370)
- KK Sigma
- K11400K
- K*K*
- phi f0(980)





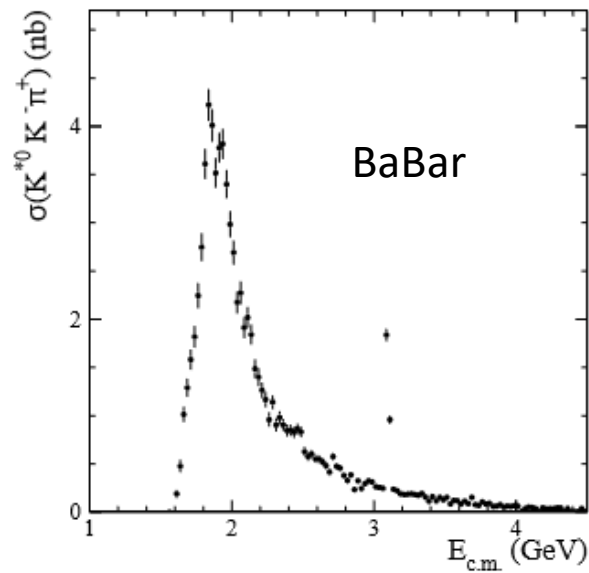


FIG. 9: The $e^+e^- \rightarrow K^*(892)^0 K^- \pi^+$ cross section, obtained from the $K^*(892)^0$ signal of Fig. 5(b).

$K^*(892)^0 K^- \pi^+$ PHSP;
 $K^*(892)^0 \rightarrow K_S \pi^0$;
 1000k 13887 efficiency: 1.3887%
 Cross section: 2 nb

$$0.013887 \cdot 108 \cdot 2000 \cdot 0.333 \cdot 0.3 \cdot 0.98^3 = 282 \times 2$$

$K^* + K - \pi^0$