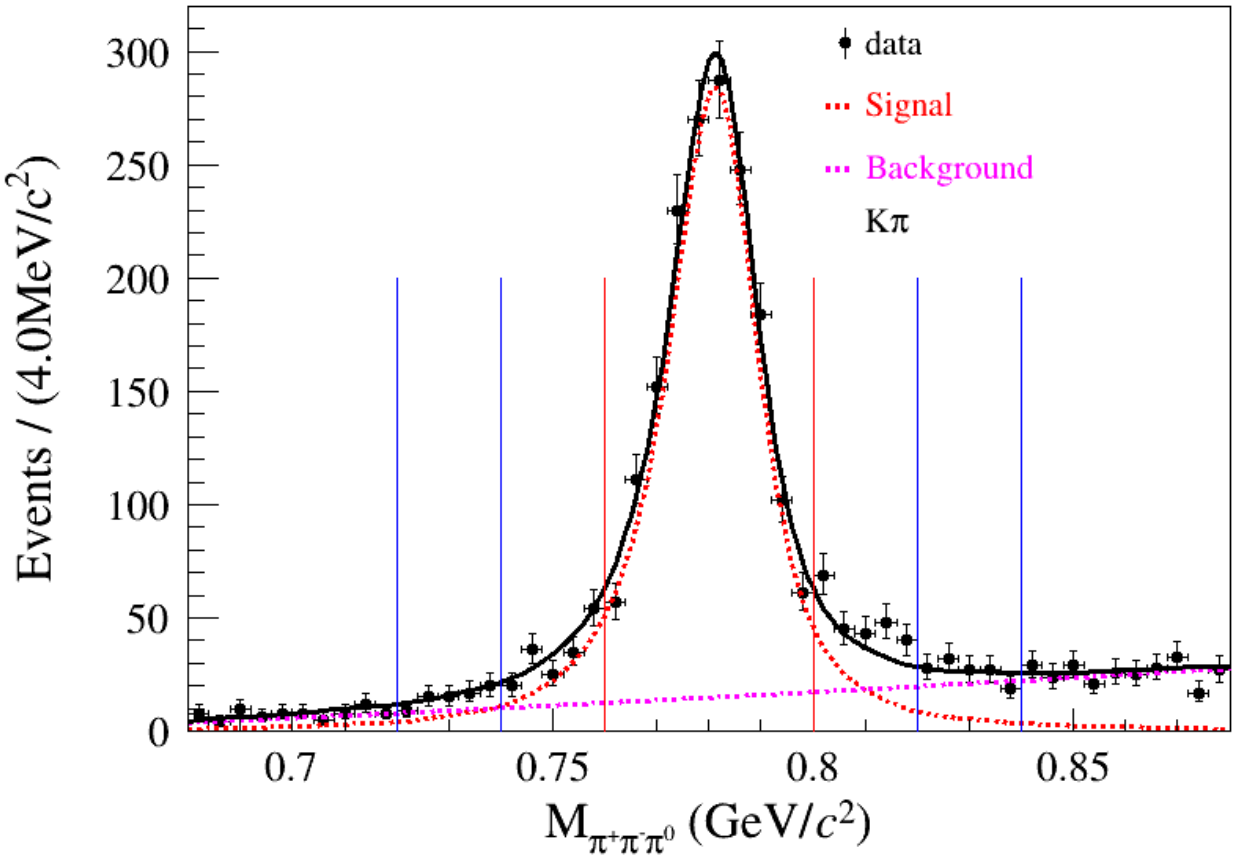
Study of $D^0 \to K_S^0\, \omega$

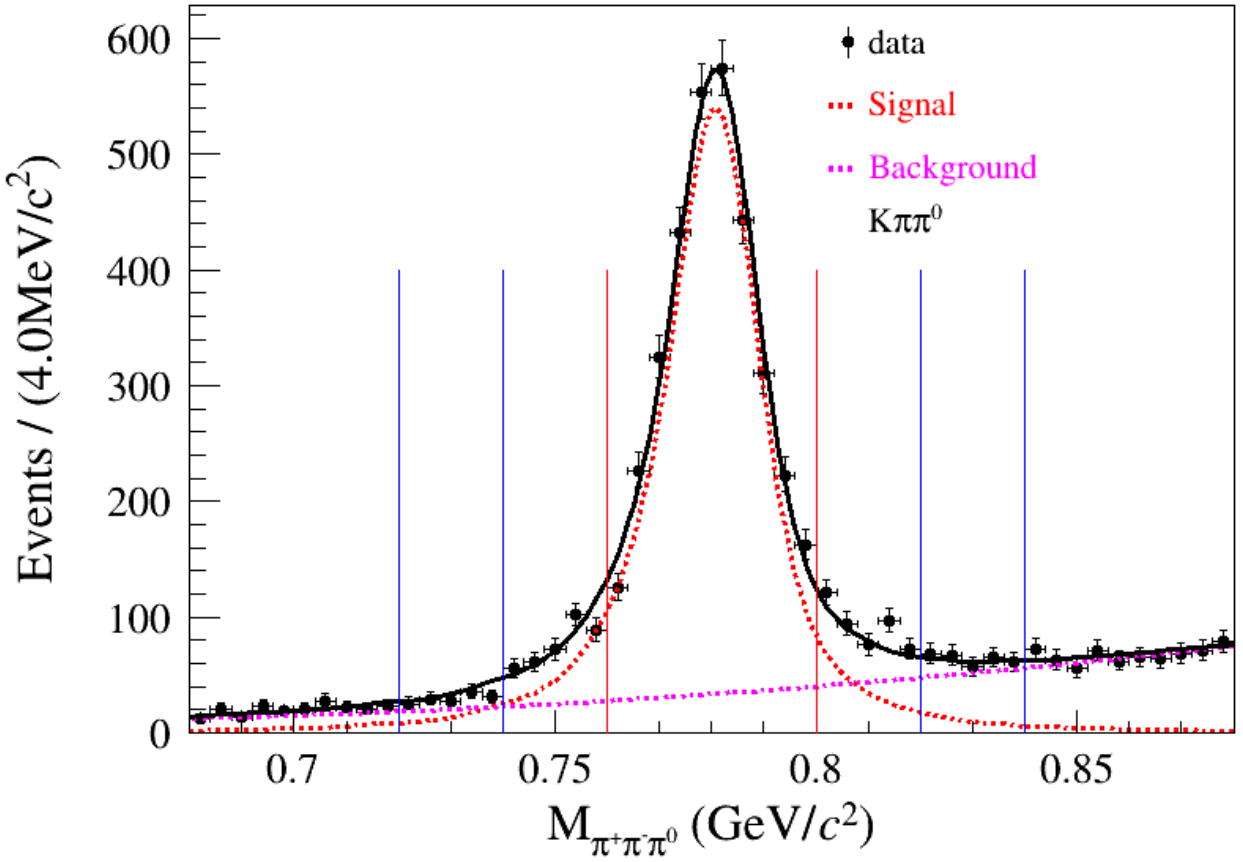


Signal: Mc shape ⊗ Gaussian
BKG: second-order Chebyshev

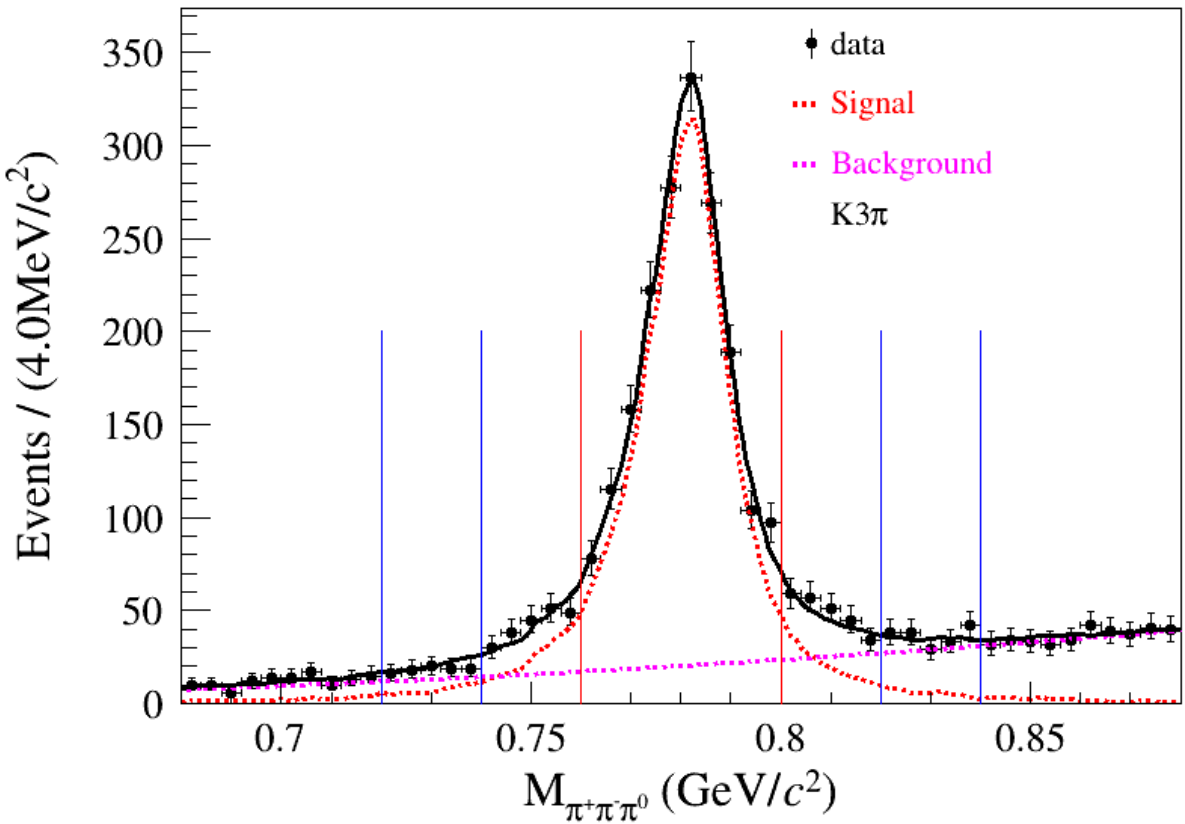
$signal\ region$: (0.76,0.80) GeV
$sideband\ region$: (0.72,0.74)U(0.82,0.84) GeV

$$f = \frac{N_{sig}^{bkg}}{N_{side}^{bkg}}$$

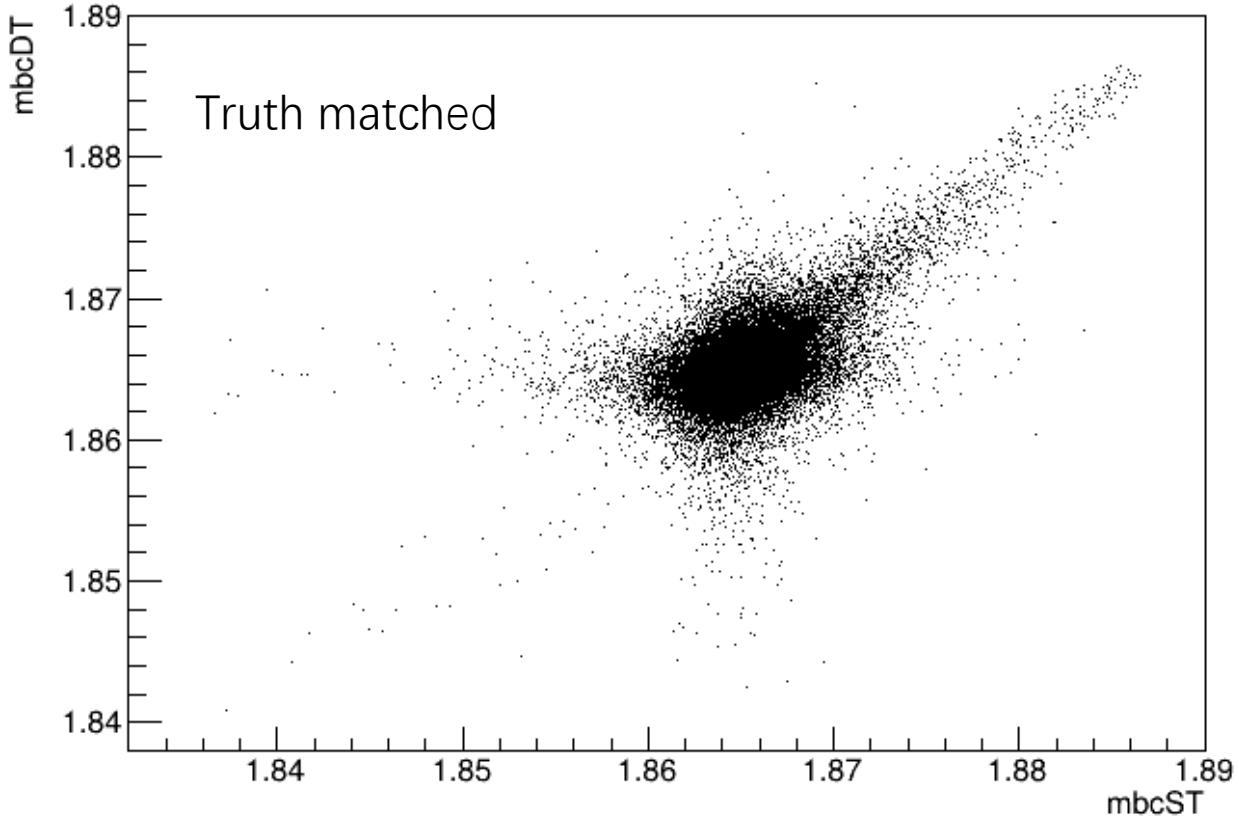
$$N_{sig}^{bkg} = 148.5 \pm 9.1$$
$$N_{side}^{bkg} = 150.7 \pm 7.0$$
$$f^{K\pi} = 0.985 \pm 0.075$$

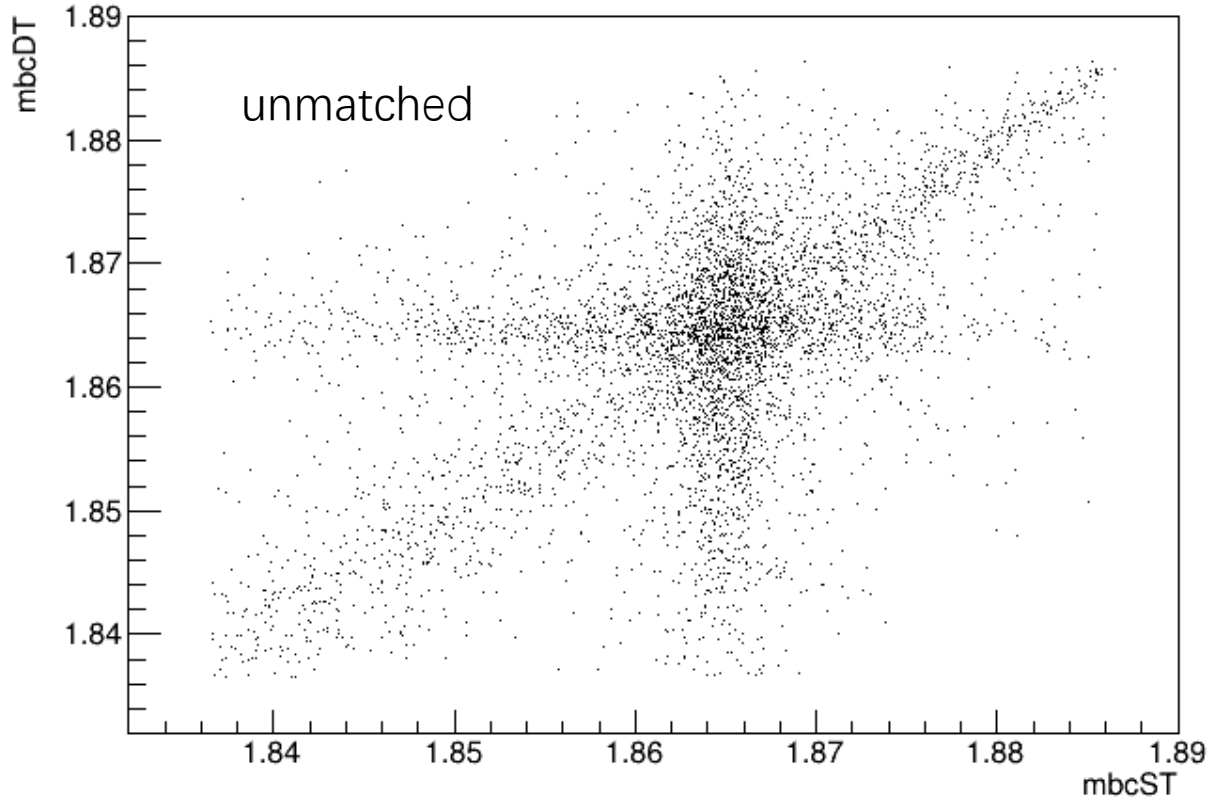


$$N_{sig}^{bkg} = 337.8 \pm 12.9$$
$$N_{side}^{bkg} = 362.9 \pm 10.6$$
$$f^{K\pi\pi^0} = 0.931 \pm 0.045$$



$$N_{sig}^{bkg} = 203.6 \pm 10.5$$
$$N_{side}^{bkg} = 211.3 \pm 8.3$$
$$f^{K\pi} = 0.963 \pm 0.063$$


Truth matched
mbcDT
mbcST
1.89
1.88
1.87
1.86
1.85
1.84
1.84
1.85
1.86
1.87
1.88
1.89

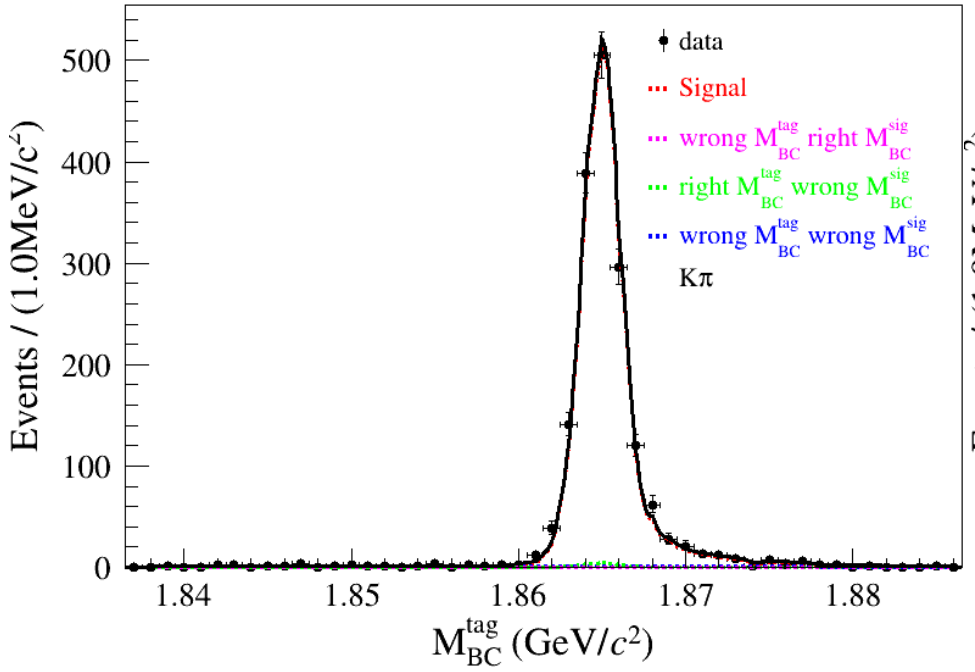

unmatched
mbcDT
mbcST
1.89
1.88
1.87
1.86
1.85
1.84
1.84
1.85
1.86
1.87
1.88
1.89

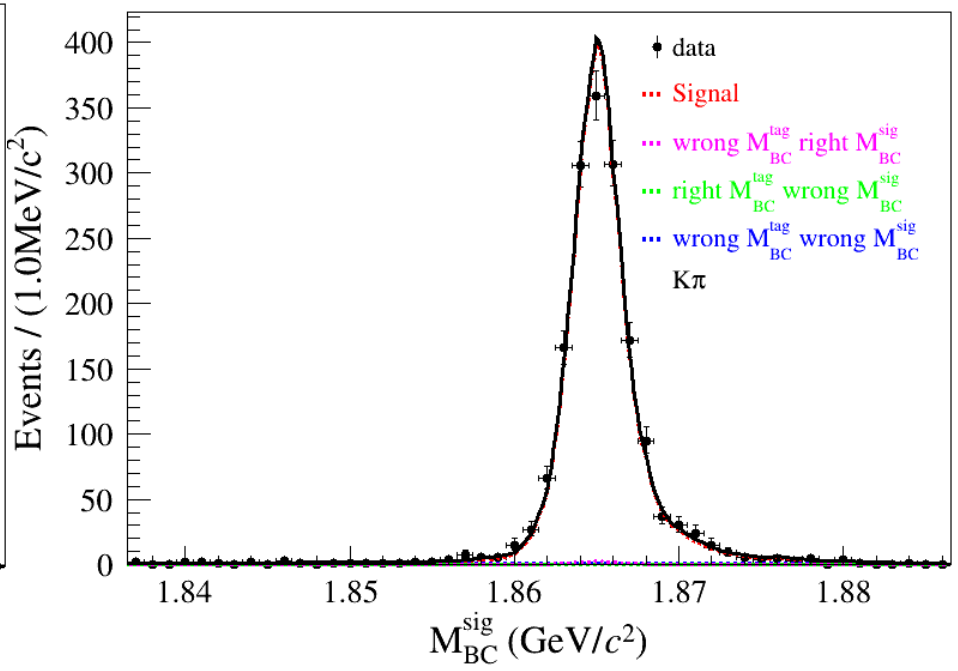
$N_{DT}^{sigregion} = 1628.4 \pm 41.3$

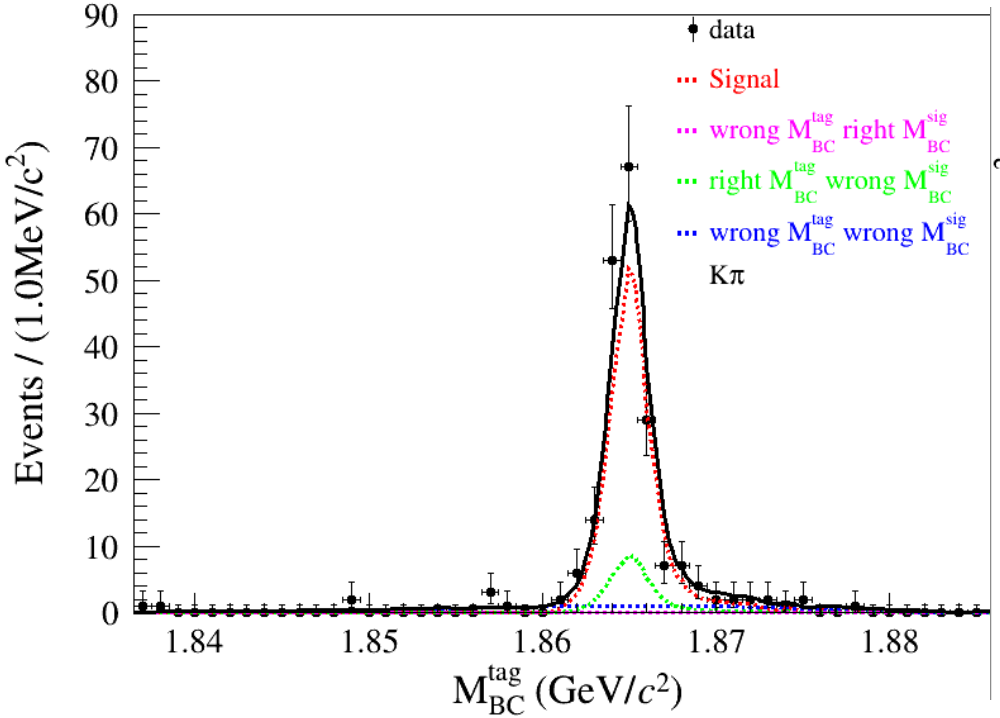
$N_{DT}^{sideband} = 156.9 \pm 5.2$

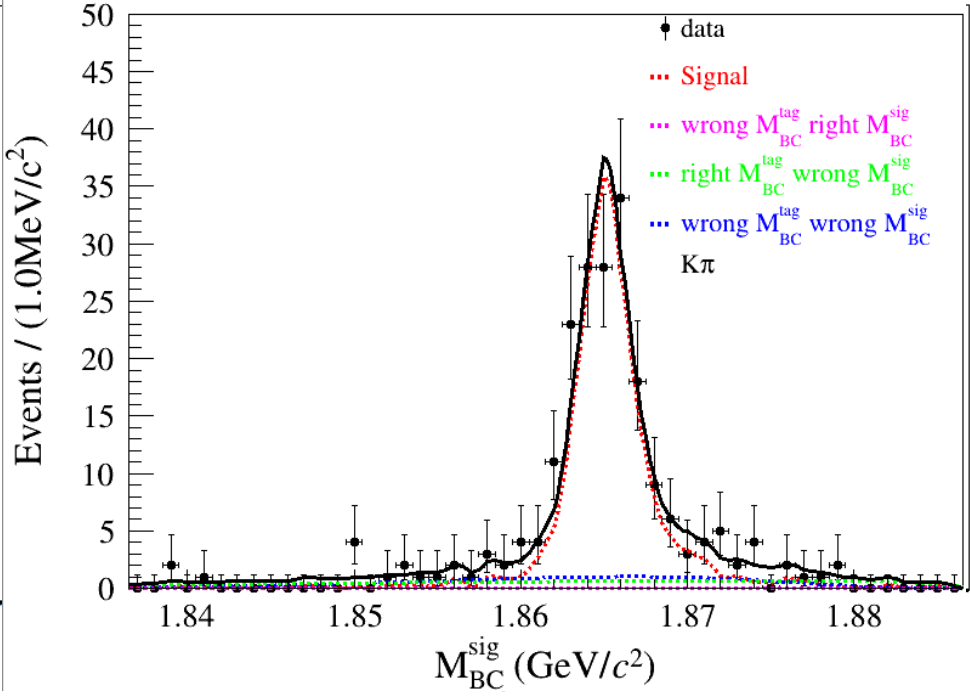
$N_{Fit}^{sigregion} - 0.985 N_{Fit}^{sideband} = 1473.85 \pm 41.6$

$N_{Fit}^{ST} = 1481840 \pm 1281.82$

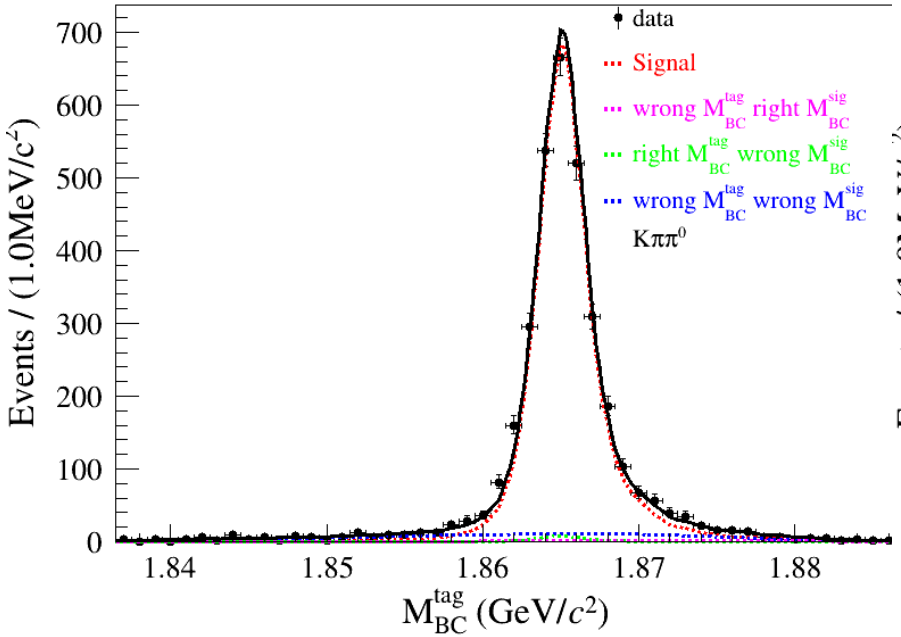


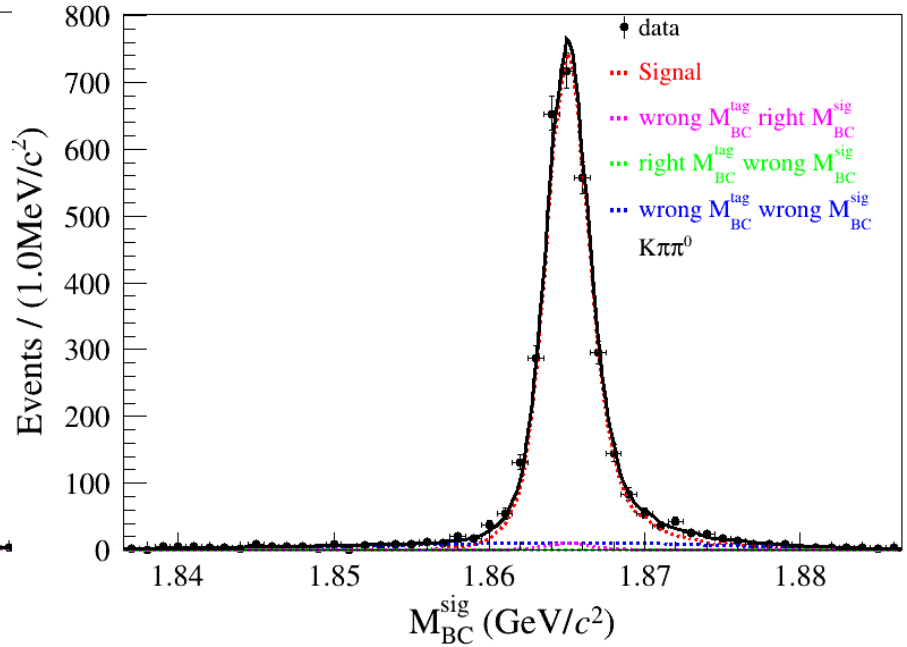






$N_{DT}^{sigregion} = 2995.8 \pm 59.9$

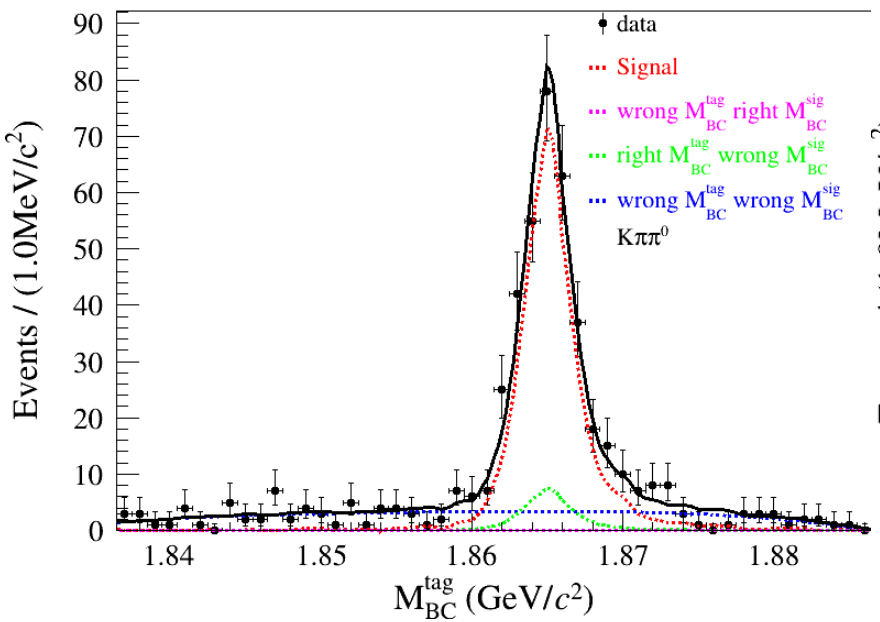


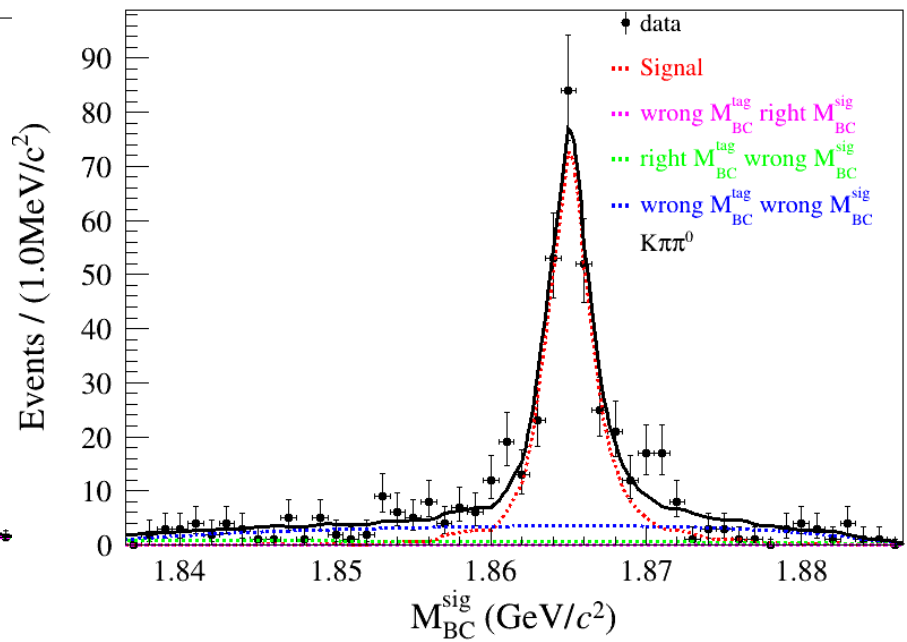


$N_{DT}^{sideband} = 300.6 \pm 20.1$

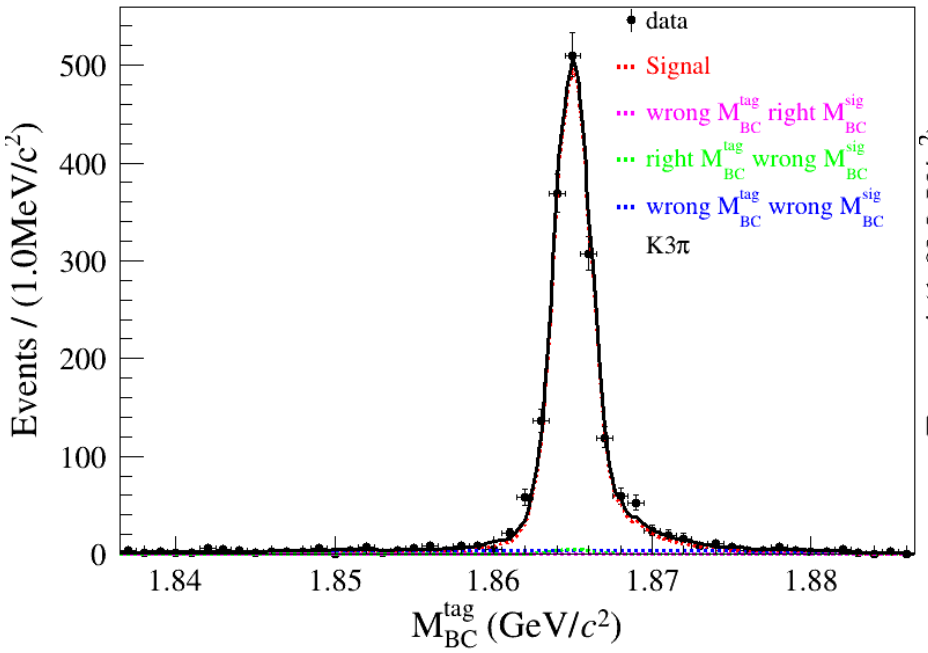
$N_{Fit}^{sigregion} - 0.931 N_{Fit}^{sideband} = 2715.94 \pm 62.7$

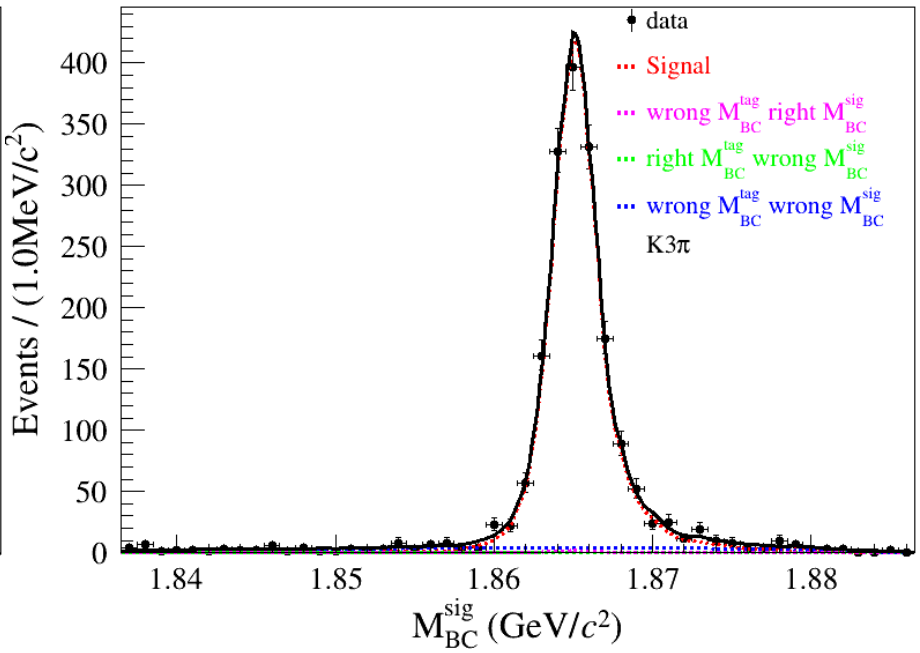
$N_{Fit}^{ST} = 3174880 \pm 2177.2$





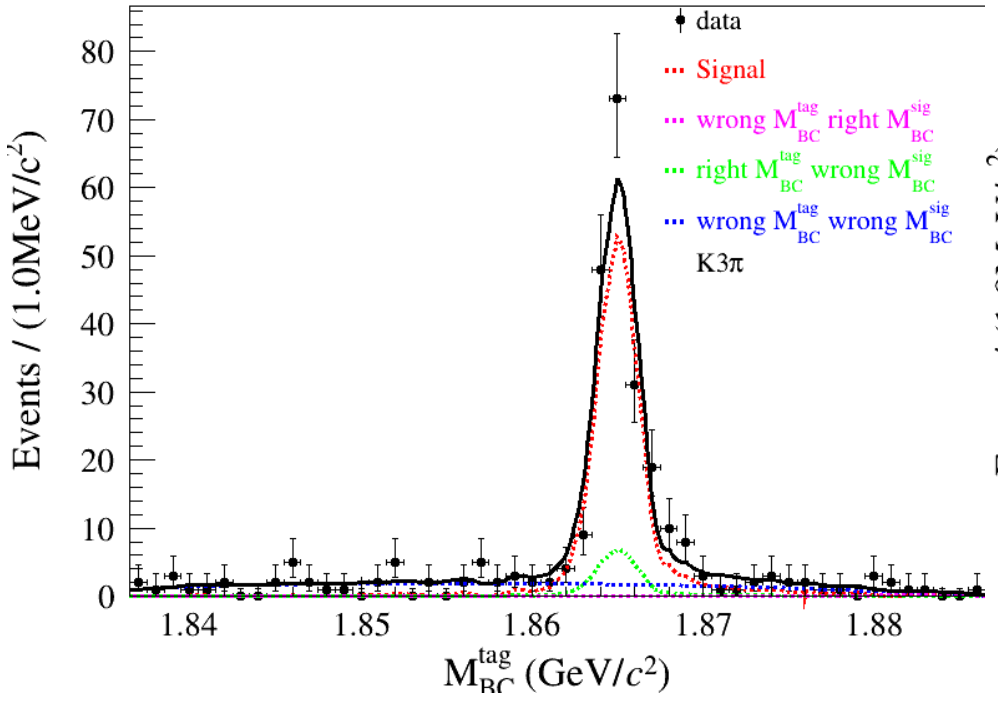
$N_{DT}^{sigregion} = 1680 \pm 43.1$

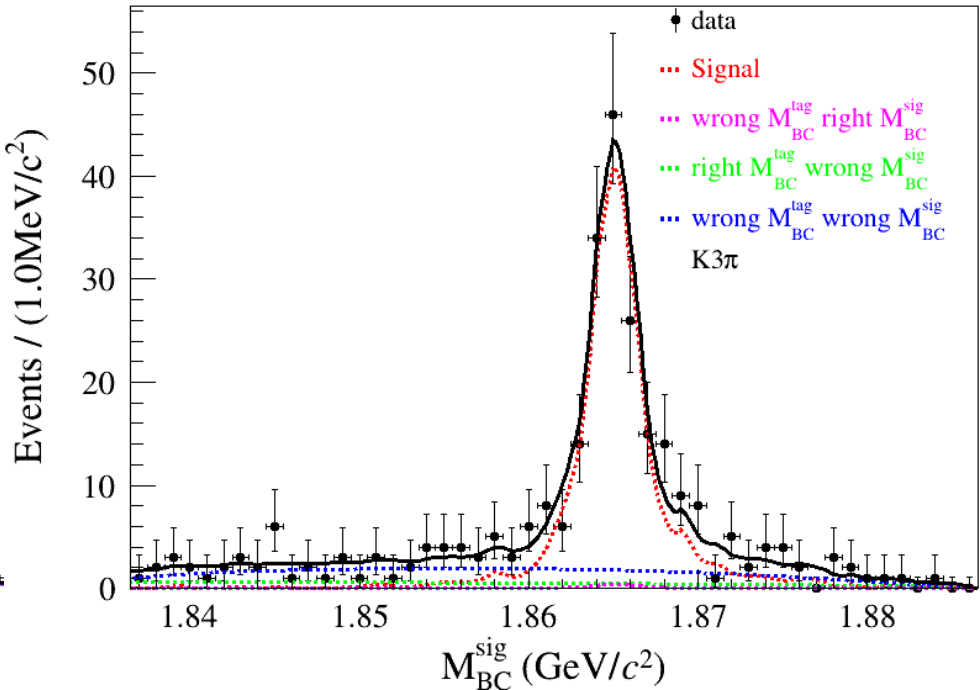




$N_{DT}^{sideband} = 176.3 \pm 15.1$

$N_{Fit}^{sigregion} - 0.963 N_{Fit}^{sideband} = 1510.2 \pm 45.5$





Tag mode	ST field	Efficiency(%)	$\mathbf{N_{ST}^{i}}$
$\bar{D}^0 \to K^+\pi^-$	1492334±1298	67.52±0.06	2210210.3 ± 2748.3
$\bar{D}^0 \to K^+\pi^-\pi^0$	3061045±6734	37.00±0.07	8273094.6 ± 24004.5
$\bar{D}^0 \to K^+\pi^-\pi^+\pi^-$	2019379±2235	42.35±0.04	4768309.3 ± 6937.9

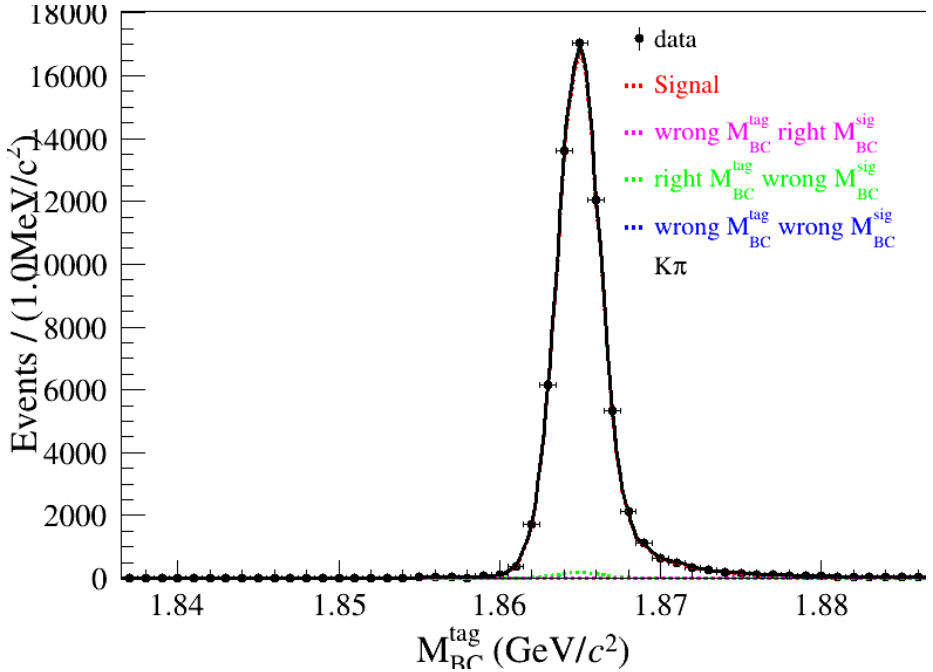
Tag mode	DT field	Efficiency(%)	$\mathbf{N_{DT}^{i}}$
$\bar{D}^0 \to K^+\pi^-$	1473.85 ± 41.6	9.86 ± 0.04	14947.7 ± 426.2
$\bar{D}^0 \to K^+\pi^-\pi^0$	2715.94 ± 62.7	4.66 ± 0.03	58281.1 ± 1396.8
$\bar{D}^0 \to K^+\pi^-\pi^+\pi^-$	1510.2 ± 45.5	4.02 ± 0.03	37567.1 ± 1166

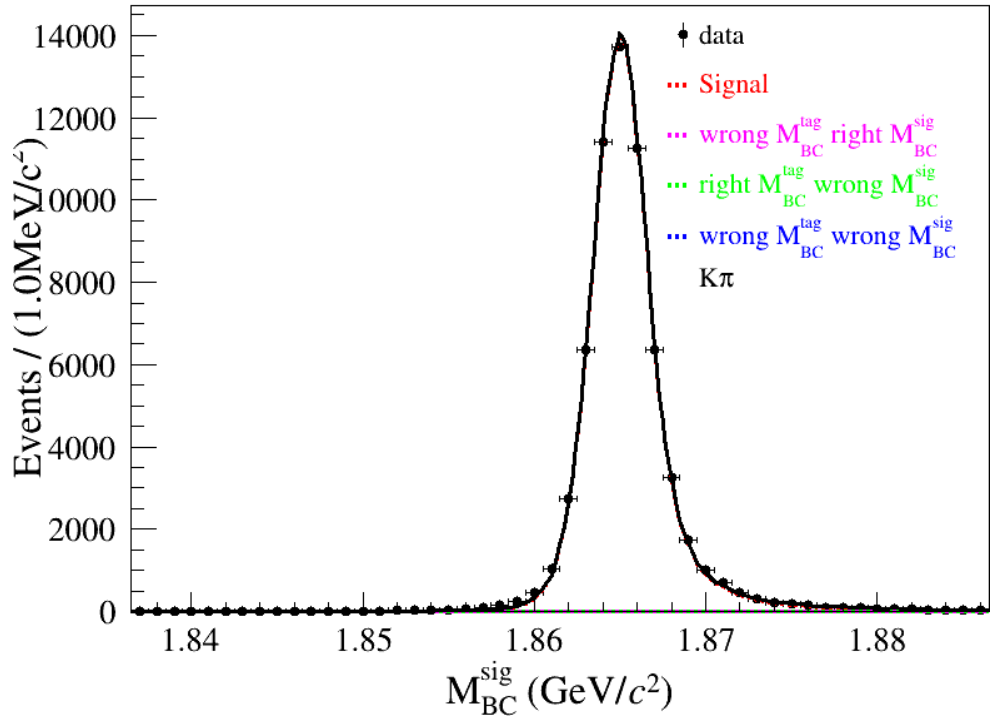
Tag modes	f_{QC}
$\bar{D}^0 \to K^+\pi^-$	$0.898^{+0.003}_{-0.007}$
$\bar{D}^0 \to K^+\pi^-\pi^0$	0.935 ± 0.007
$\bar{D}^0 \to K^+\pi^-\pi^+\pi^-$	$0.972^{+0.020}_{-0.013}$

$$f_{QC} = \frac{\Sigma_i f_{QC}^i * N_{ST}^i}{N_{ST}} = 0.941^{+0.007}_{-0.006}$$

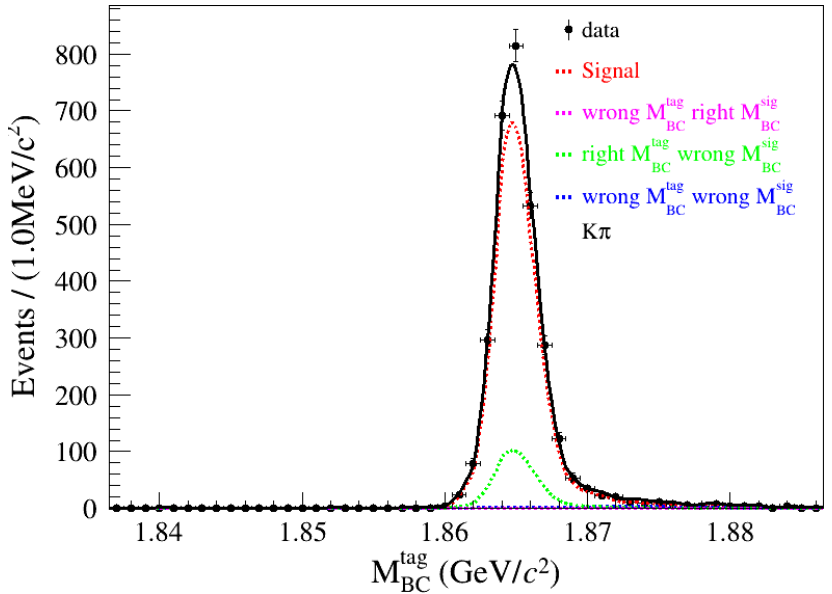
- $N_{ST}^{tot} = 15251614.2 \pm 25137.7$
- $N_{DT}^{tot} = 110795.9 \pm 1868.7$
- $Br = (6.835 \pm 0.11) \times 10^{-3}$

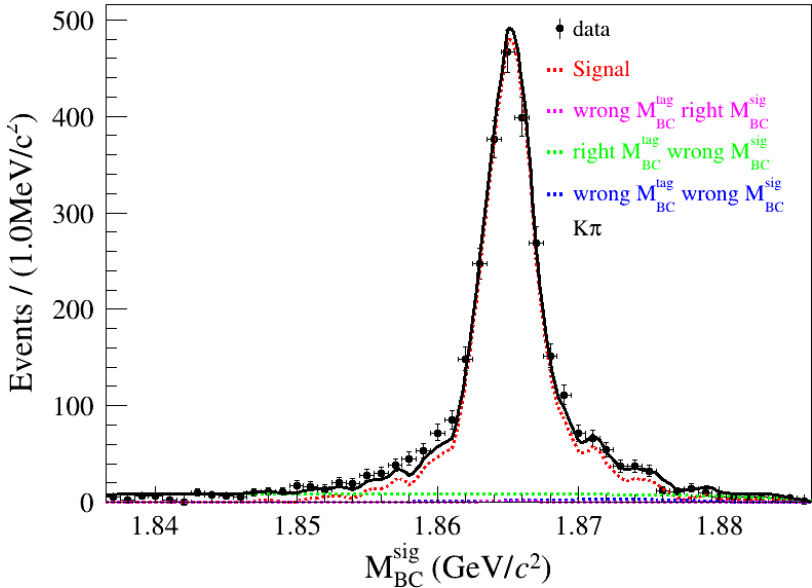
- $f_{QC} = \frac{\Sigma_i f_{QC}^i * N_{ST}^i}{N_{ST}} = \frac{1984768.8^{+7074}_{-15667} + 7735343.5^{+62108.6}_{-62108.6} + 4634796.6^{+95606.8}_{-62357.5}}{15251614.2 \pm 25137.7}$
- $= \frac{14354908.9^{+114228.6}_{-89394.6}}{15251614.2^{+25137.7}_{-25137.7}} = 0.941^{+0.0076}_{-0.006}$
- $= 0.941^{+0.007}_{-0.006}$

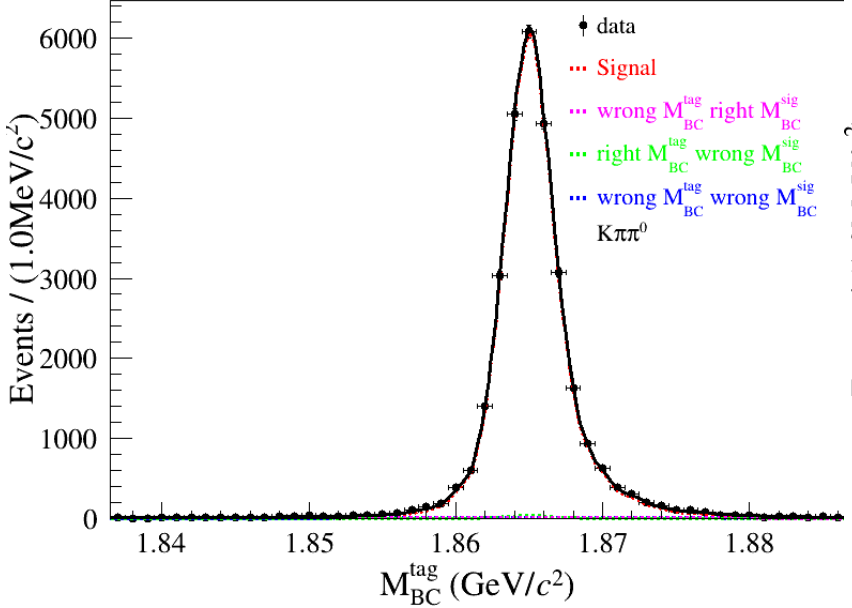


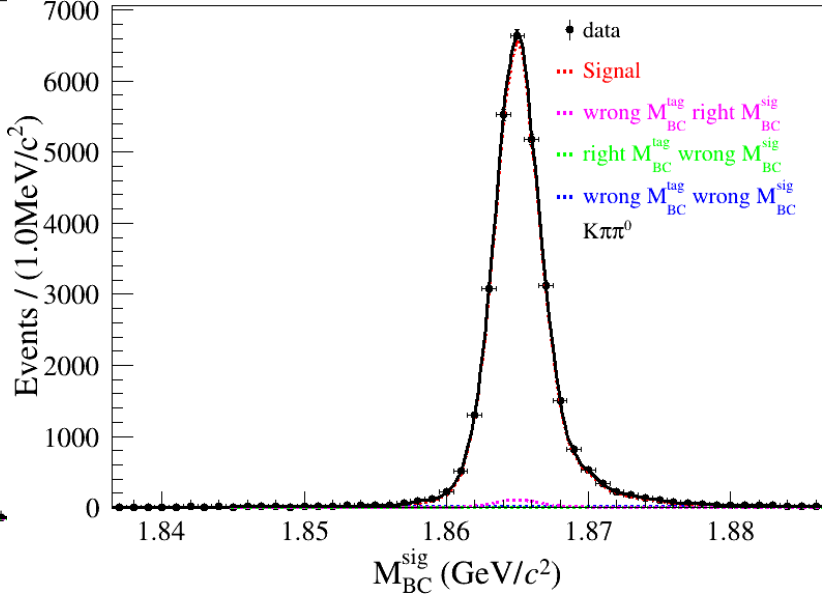


- $61779.3 \pm 254.6 - 0.985 * 2612.7 \pm 33.6$

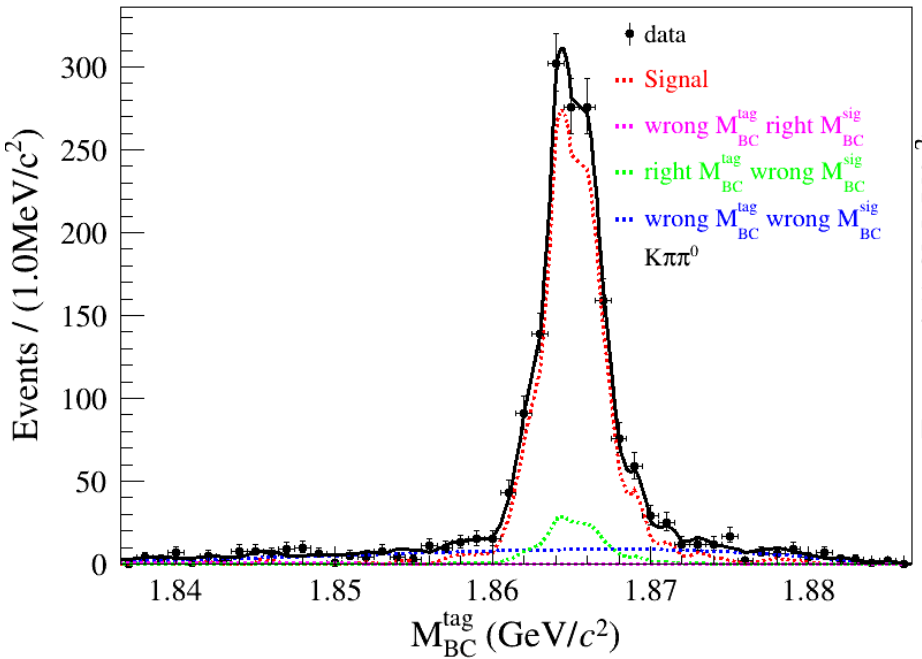


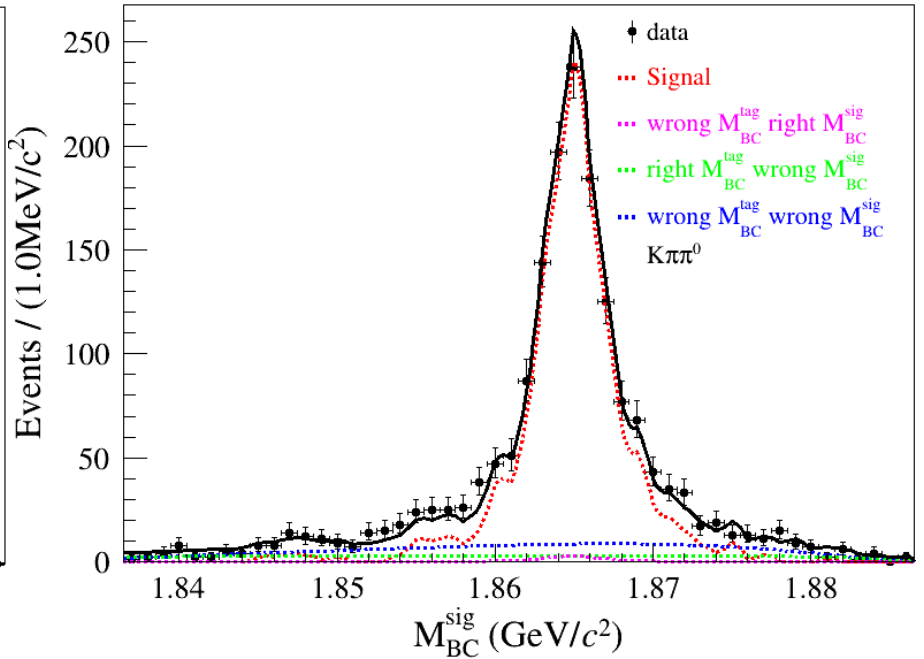
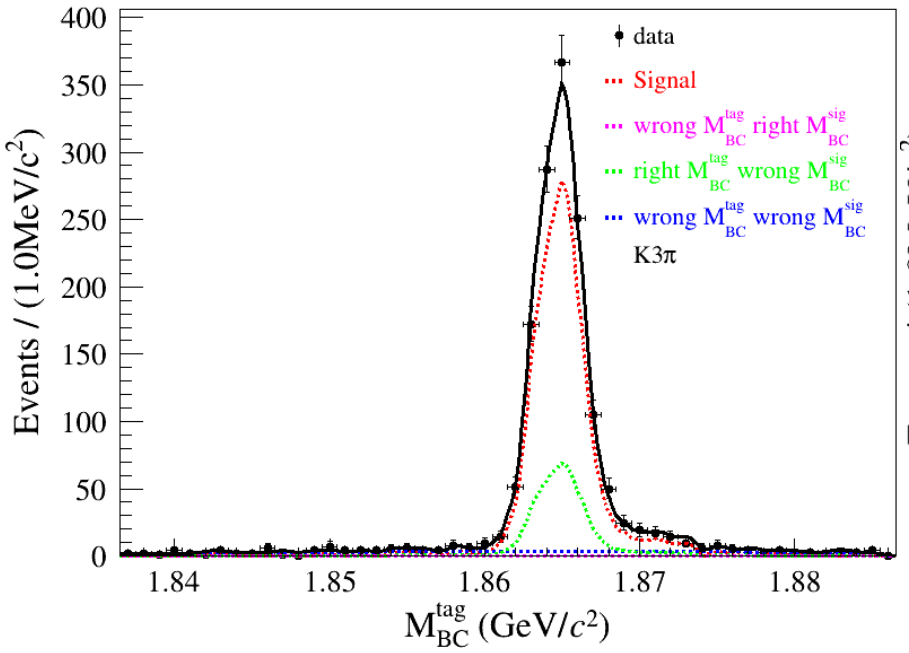
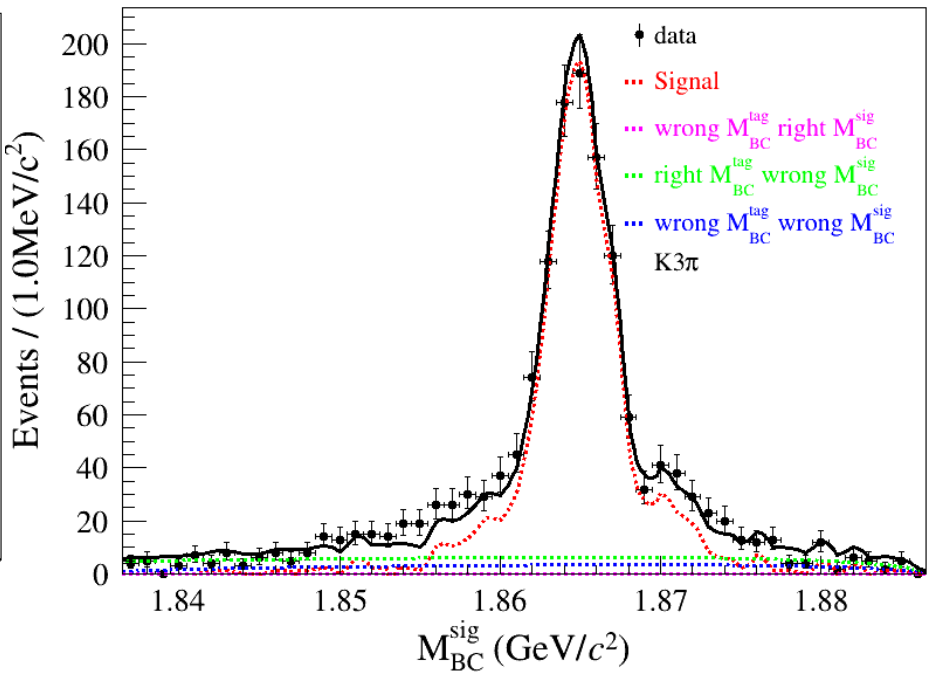






- $(29175.1 \pm 193.7) - 0.931 * (1297.1 \pm 40.3)$





- $(25228.0 \pm 196.8) - 0.963 * (1107.4 \pm 37.2)$