

Supplementary material

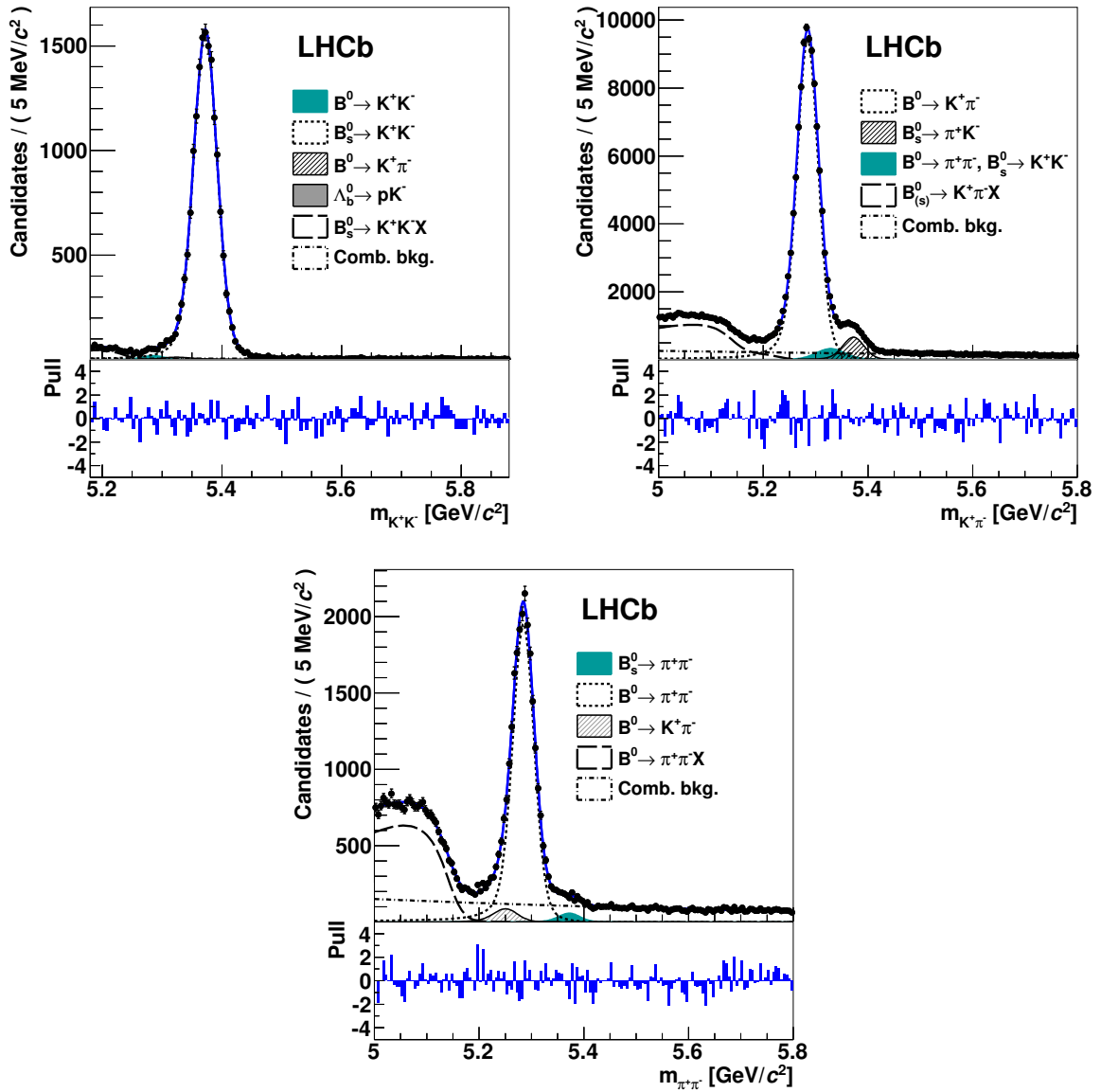


Figure 1: Invariant mass distribution of the (top left) K^+K^- , (top right) $K^+\pi^-$ and (bottom) $\pi^+\pi^-$ spectra after $S_{K^+K^-}$. The curves superimposed on data points represent the result of the best fit. The most relevant contributions to the invariant mass spectra are also shown.

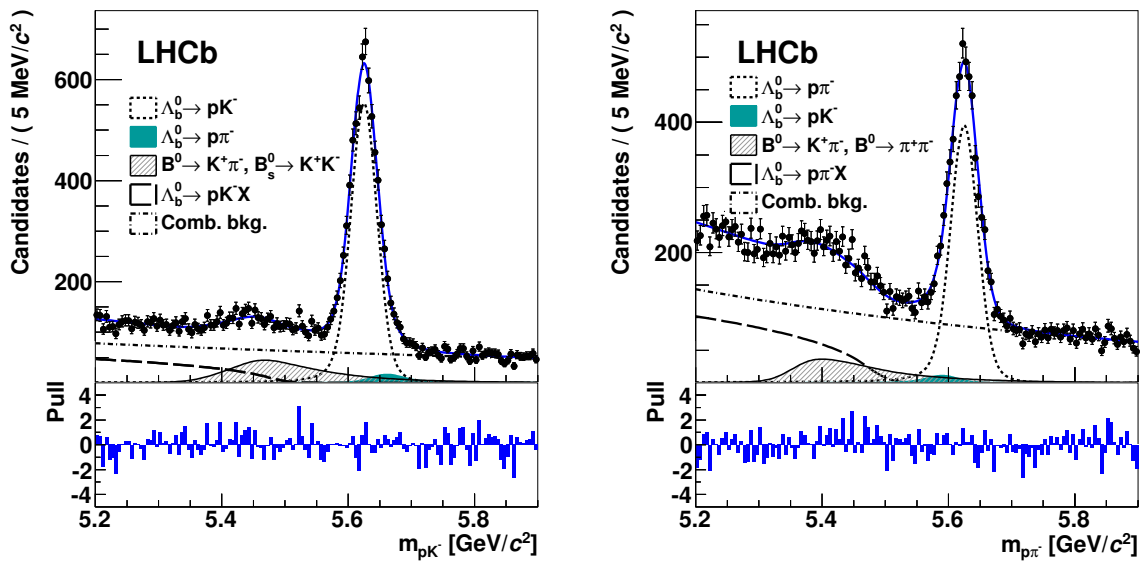


Figure 2: Invariant mass distribution of the (left) pK^- and (right) $p\pi^-$ spectra after $S_{K^+K^-}$. The curves superimposed on data points represent the result of the best fit. The most relevant contributions to the invariant mass spectra are also shown.

Table 1: Two-body b -hadron event yields determined from the fits to the invariant mass spectra of decay candidates passing $S_{K^+K^-}$.

Decay	Yield
$B^0 \rightarrow \pi^+\pi^-$	21987 ± 185
$B^0 \rightarrow K^+\pi^-$	105010 ± 431
$B^0 \rightarrow K^+K^-$	201 ± 33
$B_s^0 \rightarrow K^+K^-$	16399 ± 135
$B_s^0 \rightarrow \pi^+K^-$	7459 ± 162
$B_s^0 \rightarrow \pi^+\pi^-$	654 ± 63
$\Lambda_b^0 \rightarrow pK^-$	6170 ± 98
$\Lambda_b^0 \rightarrow p\pi^-$	4617 ± 92

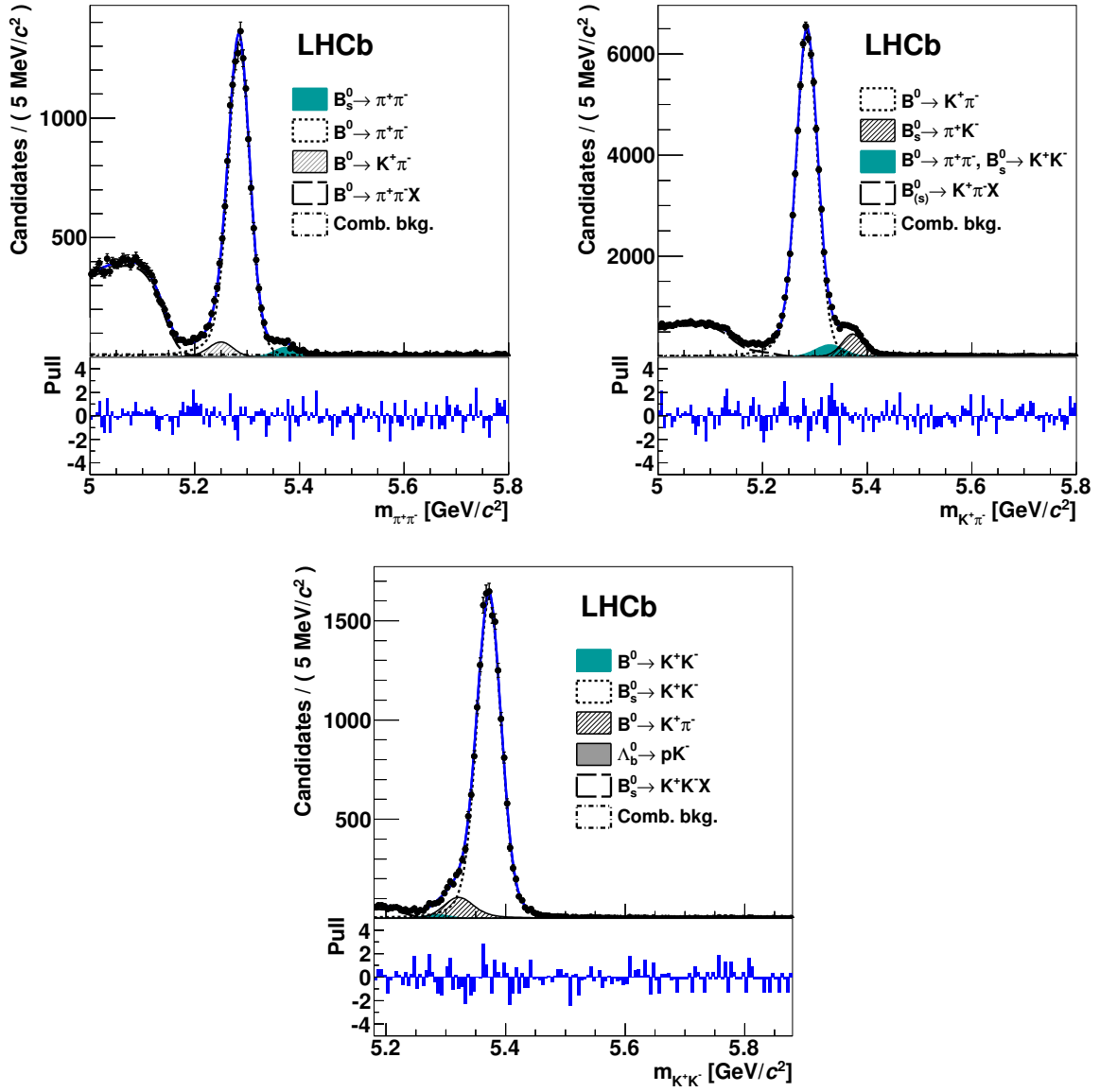


Figure 3: Invariant mass distribution of the (top left) $\pi^+\pi^-$, (top right) $K^+\pi^-$ and (bottom) K^+K^- spectra after $S_{\pi^+\pi^-}$. The curves superimposed on data points represent the result of the best fit. The most relevant contributions to the invariant mass spectra are also shown.

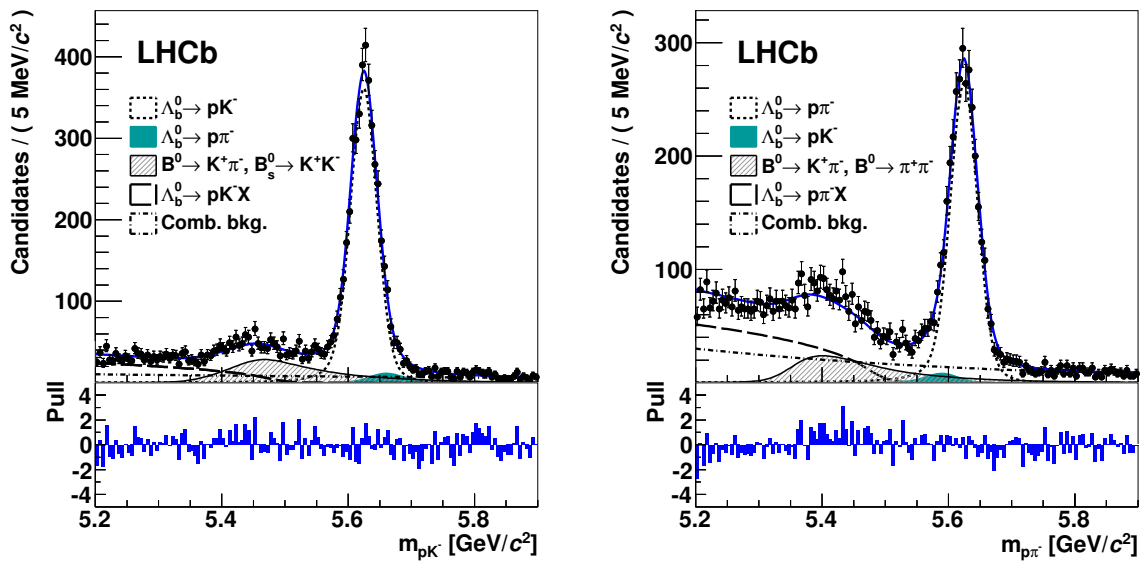


Figure 4: Invariant mass distribution of the (left) pK^- and (right) $p\pi^-$ spectra after $S_{\pi^+\pi^-}$. The curves superimposed on data points represent the result of the best fit. The most relevant contributions to the invariant mass spectra are also shown.

Table 2: Two-body b -hadron event yields determined from the fits to the invariant mass spectra of decay candidates passing $S_{\pi^+\pi^-}$.

Decay	Yield
$B^0 \rightarrow \pi^+\pi^-$	14916 ± 136
$B^0 \rightarrow K^+\pi^-$	71304 ± 312
$B^0 \rightarrow K^+K^-$	210 ± 40
$B_s^0 \rightarrow K^+K^-$	17632 ± 141
$B_s^0 \rightarrow \pi^+K^-$	5097 ± 111
$B_s^0 \rightarrow \pi^+\pi^-$	455 ± 35
$\Lambda_b^0 \rightarrow pK^-$	4058 ± 73
$\Lambda_b^0 \rightarrow p\pi^-$	3068 ± 65