

## Supplementary material for LHCb-PAPER-2015-027

This supplementary file contains figures that are approved for public presentation. The first figure is simply the fit to the  $B^+ \rightarrow J/\psi K^+$  mass distribution used to compute  $sWeights$  for the nominal calibration and performance measurement. The next three of the figures are projections of the two dimensional fit to the  $B^0 \rightarrow J/\psi K^{*0}$  mass and lifetime distributions. The projection of the lifetime component of the fit is shown both as a normal plot and as a log plot. Two of the figures are fits to the  $B^0 \rightarrow D^-\pi^+$  and  $B_s^0 \rightarrow D_s^-\pi^+$  mass distributions. Finally, the last two figures are the  $sWeight$ -ed distributions of the (calibrated) predicted mistag probability  $\eta$  for  $B^0 \rightarrow D^-\pi^+$  and  $B_s^0 \rightarrow D_s^-\pi^+$ .

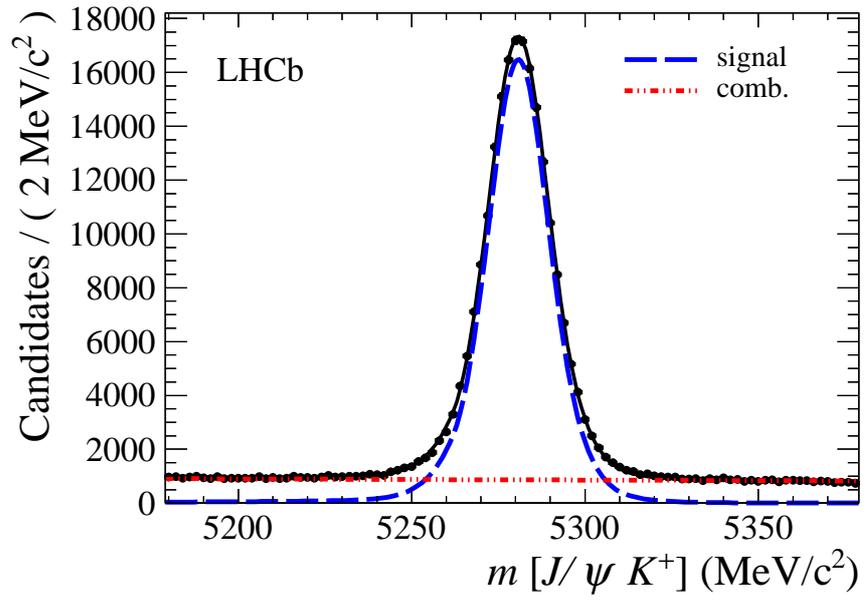


Figure 1: Fit to the  $B^+ \rightarrow J/\psi K^+$  mass distribution.

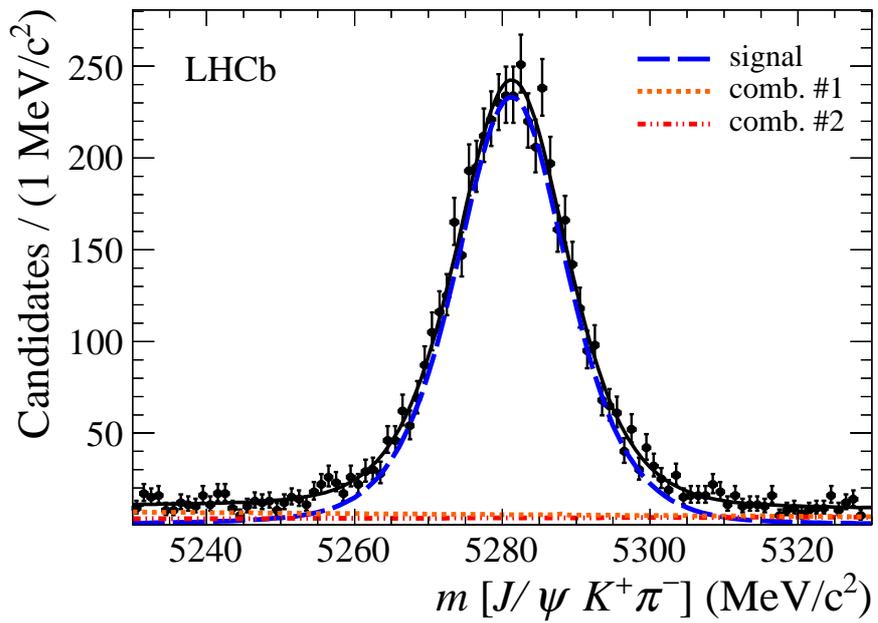


Figure 2: Fit to the  $B^0 \rightarrow J/\psi K^{*0}$  mass distribution.

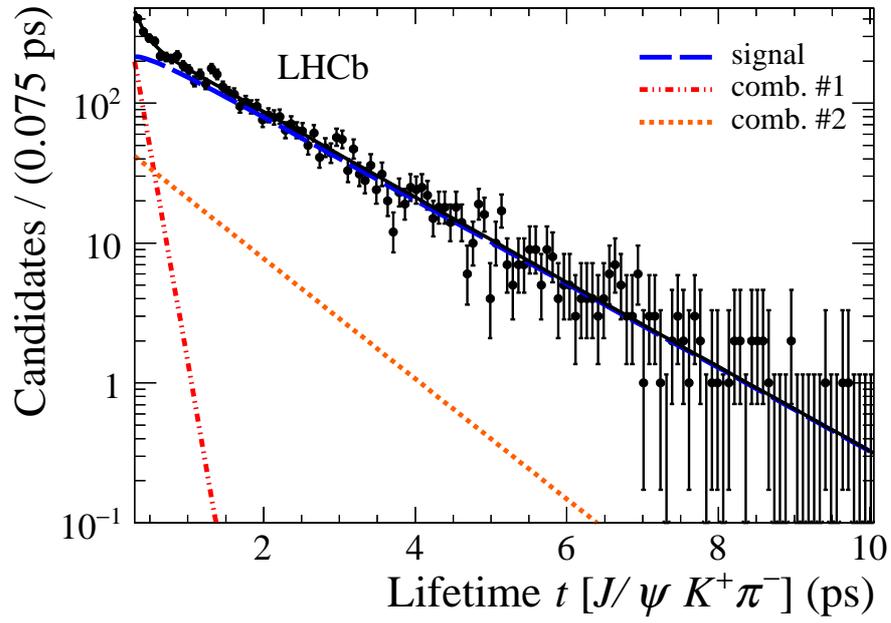


Figure 3: Fit to the  $B^0 \rightarrow J/\psi K^{*0}$  lifetime distribution.

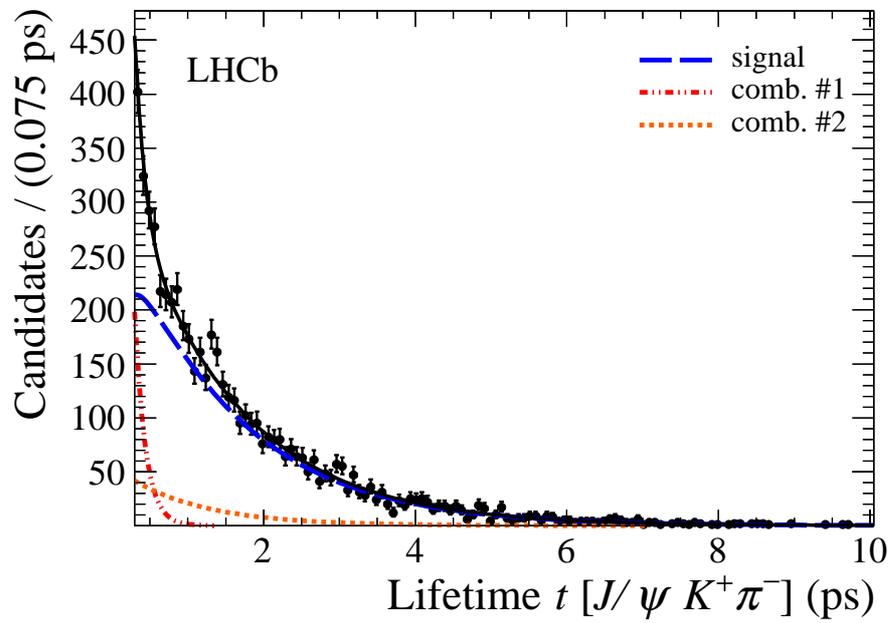


Figure 4: Fit to the  $B^0 \rightarrow J/\psi K^{*0}$  lifetime distribution.

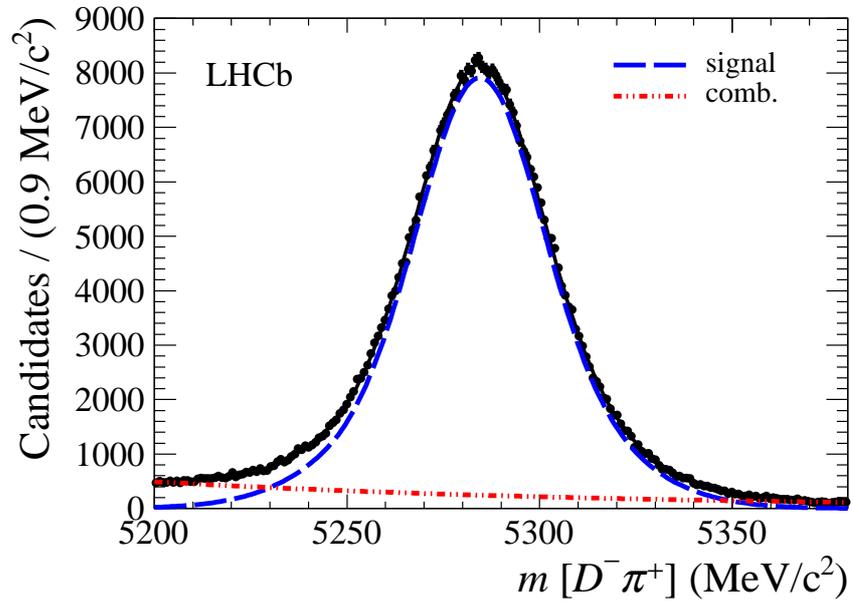


Figure 5: Fit to the  $B^0 \rightarrow D^- \pi^+$  mass distribution.

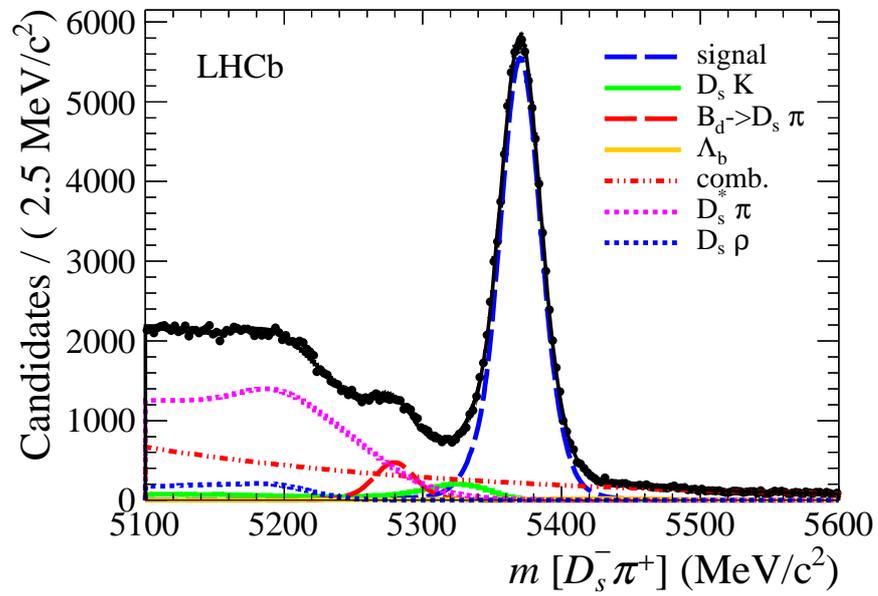


Figure 6: Fit to the  $B_s^0 \rightarrow D_s^- \pi^+$  mass distribution.

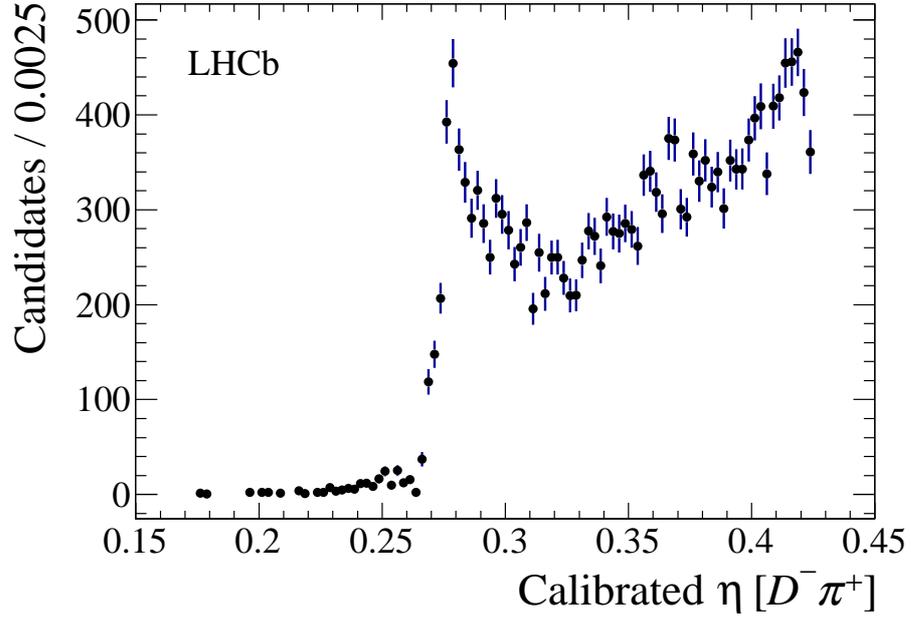


Figure 7: Distribution of the calibrated predicted mistag probability  $\omega(\eta)$  for the  $B^0 \rightarrow D^- \pi^+$  data sample.

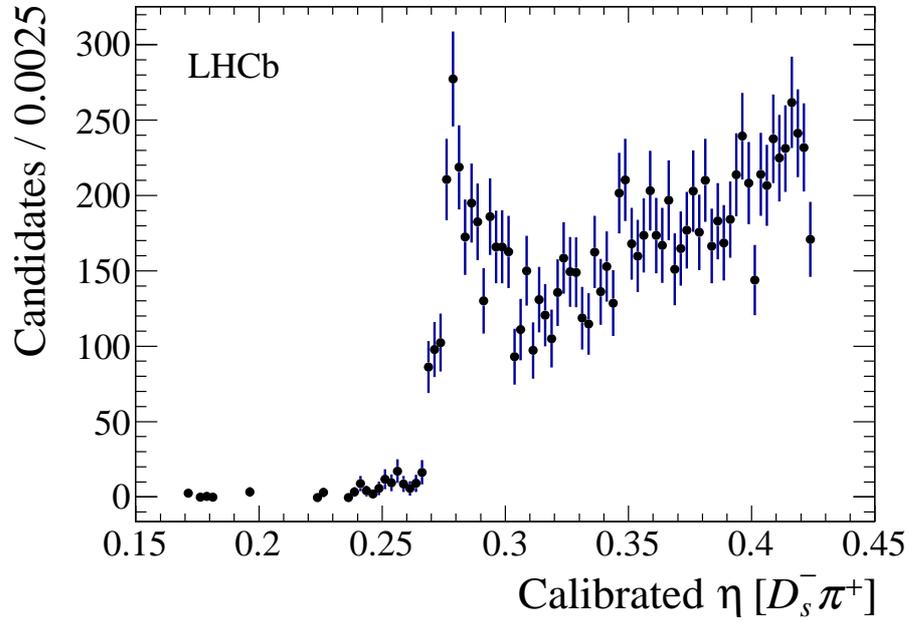


Figure 8: Distribution of the calibrated predicted mistag probability  $\omega(\eta)$  for the  $B_s^0 \rightarrow D_s^- \pi^+$  data sample.