

Supplementary material for LHCb-PAPER-2020-026

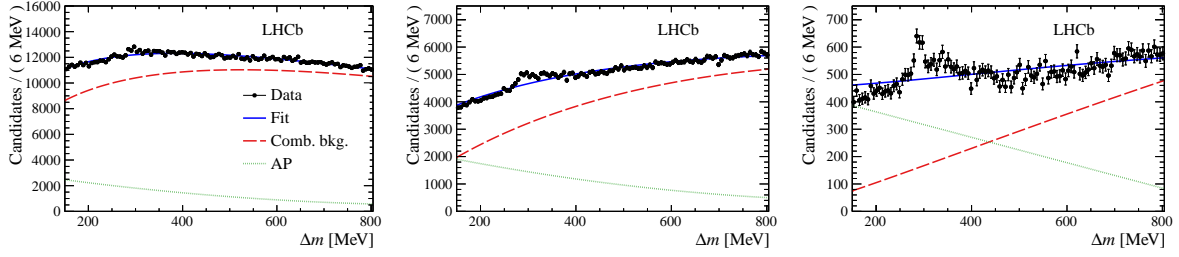


Figure 1: The B^+K^- mass difference distribution in data, overlaid with the null fit model with only a polynomial description of the excess above the same-sign data. The columns are from left to right for candidates with prompt kaon p_T $0.5 < p_T < 1$ GeV, $1 < p_T < 2$ GeV, and $p_T > 2$ GeV. The legend in the left figure is used for each figure. The associated production (AP) background is described by a second order polynomial in each fit. The combinatorial background shape is fixed from a fit to the B^+K^+ data.

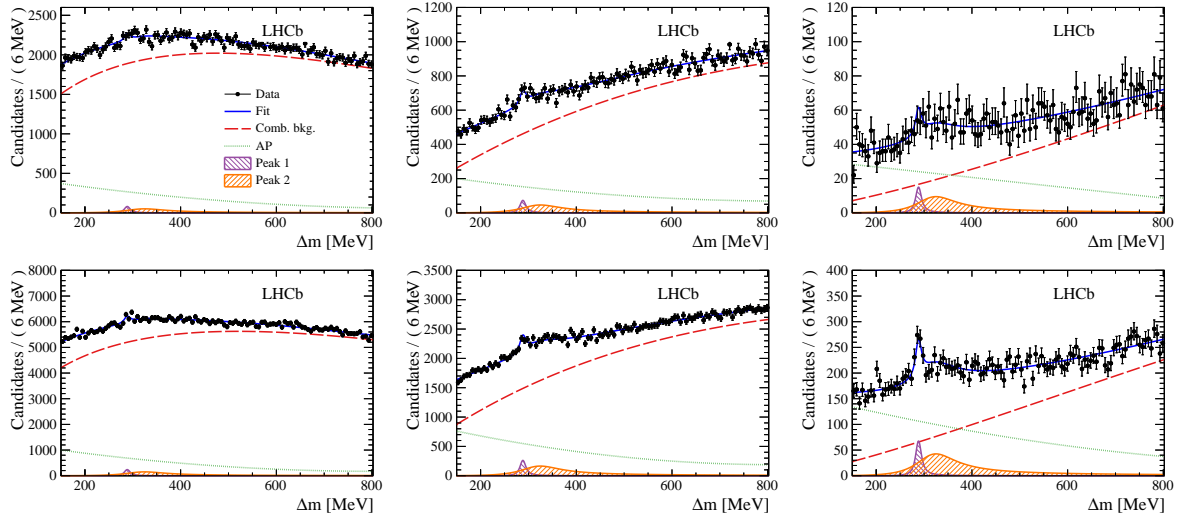


Figure 2: The B^+K^- mass difference distribution in data for the $B^+ \rightarrow J/\psi K^+$ selection, overlaid with the fit model for the production ratio result: (top row) Run 1 data and (bottom row) Run 2 data. In each row, the columns are from left to right for candidates with prompt kaon p_T $0.5 < p_T < 1$ GeV, $1 < p_T < 2$ GeV, and $p_T > 2$ GeV. The legend in the upper left is used for each figure. The associated production (AP) background is described by a second order polynomial in each fit. The combinatorial background shape is fixed from a fit to the B^+K^+ data.

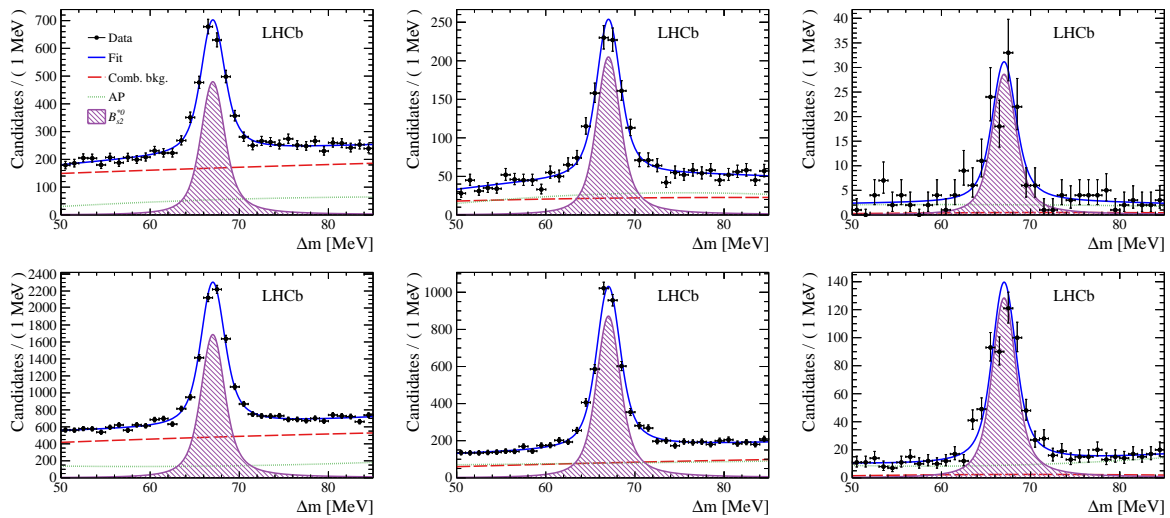


Figure 3: The B^+K^- mass difference distribution around the B_{s2}^{*0} mass in data for the $B^+ \rightarrow J/\psi K^+$ selection, overlaid with the $B_{s2}^{*0} \rightarrow B^+K^-$ fit model for the production ratio result: (top row) Run 1 data and (bottom row) Run 2 data. In each row, the columns are from left to right for candidates with prompt kaon p_T $0.5 < p_T < 1$ GeV, $1 < p_T < 2$ GeV, and $p_T > 2$ GeV. The legend in the upper left is used for each figure. The associated production (AP) background is described by a second order polynomial in each fit. The combinatorial background shape is fixed from a fit to the B^+K^+ data.