

Supplementary material for LHCb-PAPER-2014-067

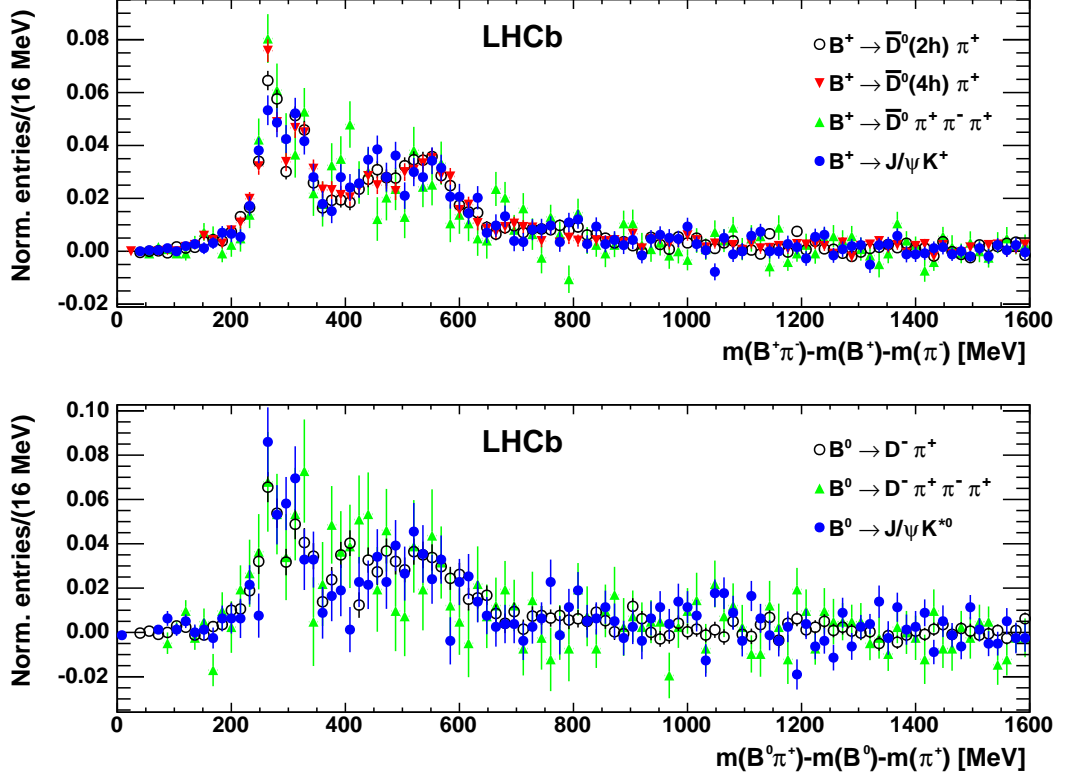


Figure 1: The normalized wrong-sign subtracted Q -value spectra for (a) B^+ and (b) B^0 modes in events with companion pion $p_T > 2$ GeV.

References

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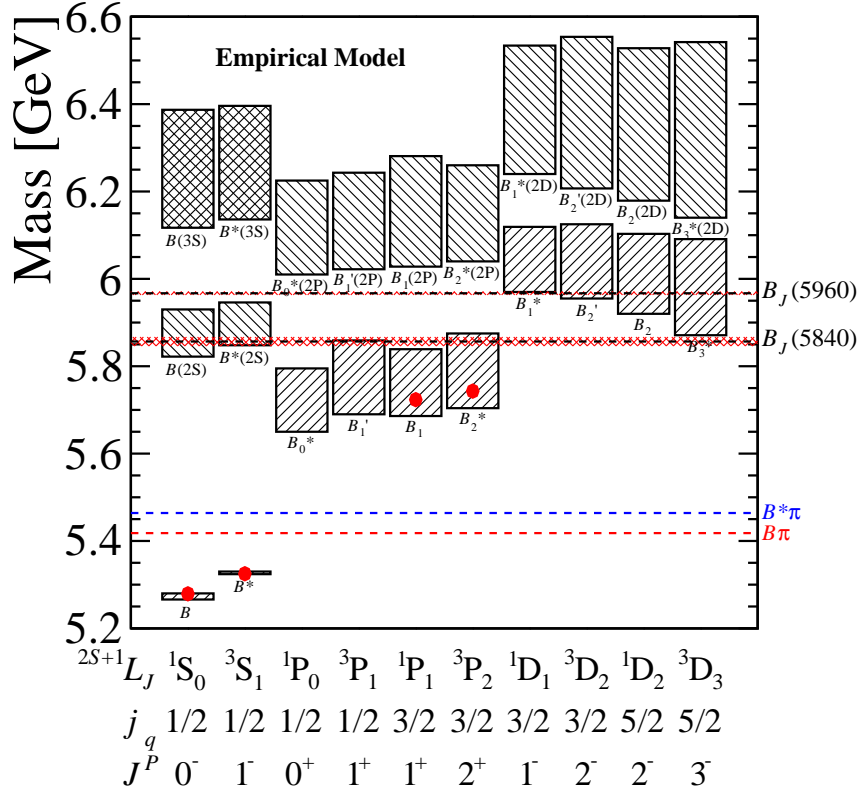


Figure 2: Mass predictions of the excited B states [1–8]. The boxes cover the range of predictions for the mass of each state, and the red dots indicate the measured values. The dashed horizontal lines correspond to the $B\pi$ and $B^*\pi$ thresholds. The horizontal red bands above show the averaged isospin masses of the $B_J(5840)^{0,+}$ and $B_J(5960)^{0,+}$ states when an empirical model with two relativistic Breit-Wigner functions is used.

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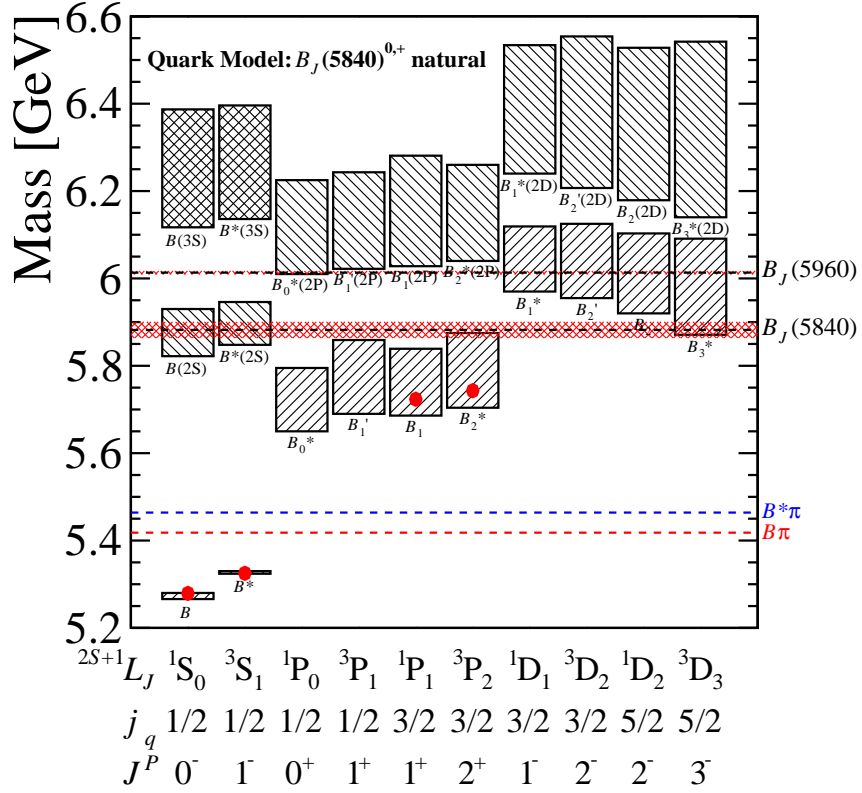


Figure 3: Mass predictions of the excited B states [1–8]. The boxes cover the range of predictions for the mass of each state, and the red dots indicate the measured values. The dashed horizontal lines correspond to the $B\pi$ and $B^*\pi$ thresholds. The horizontal red bands above show the averaged isospin masses of the $B_J(5840)^{0,+}$ and $B_J(5960)^{0,+}$ states in case the $B_J(5840)^{0,+}$ state is supposed to be natural.

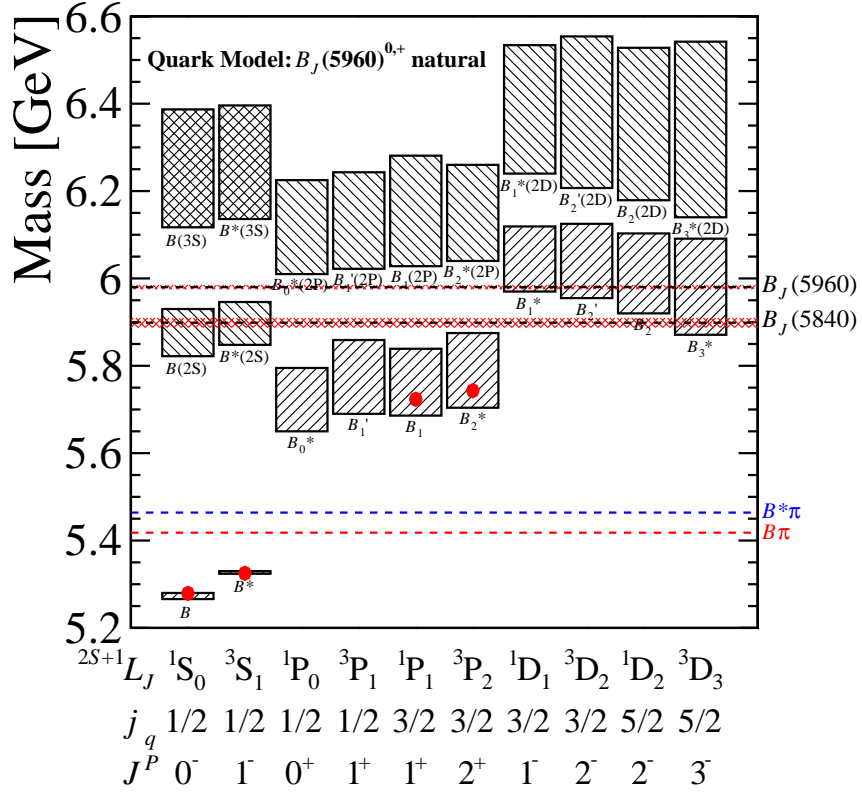


Figure 4: Mass predictions of the excited B states [1–8]. The boxes cover the range of predictions for the mass of each state, and the red dots indicate the measured values. The dashed horizontal lines correspond to the $B\pi$ and $B^*\pi$ thresholds. The horizontal red bands above show the averaged isospin masses of the $B_J(5840)^{0,+}$ and $B_J(5960)^{0,+}$ states in case the $B_J(5960)^{0,+}$ state is supposed to be natural.