Supplementary Material for LHCb-PAPER-2013-025

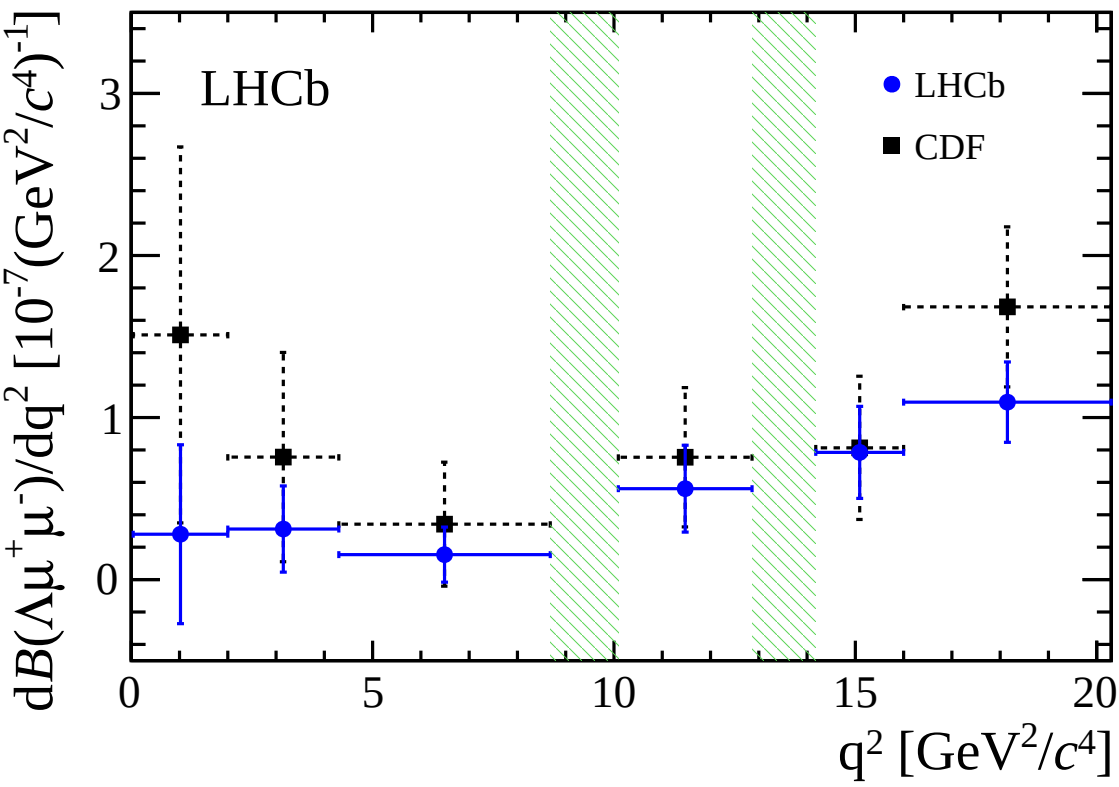

Figure 1: Differential branching fraction for the $\Lambda_b^0 \to \Lambda\mu^+\mu^-$ decay (blue points) compared to a preliminary measurement by the CDF collaboration [1] (black points). For comparison, the uncertainty due to the $\Lambda_b^0 \to J/\psi\,\Lambda$ and $J/\psi \to \mu^+\mu^-$ branching fractions, which are fully correlated across all q^2 bins and both measurements, has been subtracted. Results from CDF referenced elsewhere in this Letter are to the published CDF results [2].

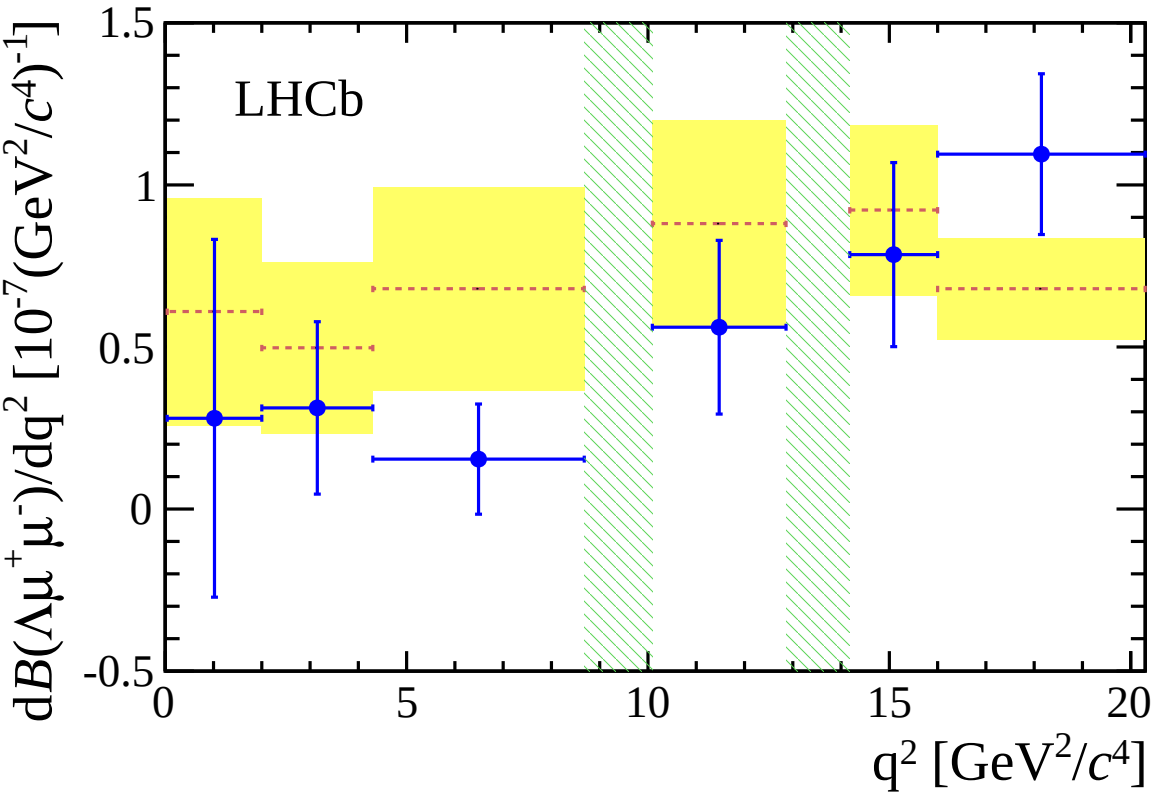

Figure 2: Differential branching fraction for the $\Lambda_b^0 \to \Lambda\mu^+\mu^-$ decay. The uncertainty arising due to components that are fully correlated across all q^2 bins, *e.g.* from the normalisation mode, are not inclued in this figure. The dashed line with the filled area shows the theoretical prediction from Ref. [3].

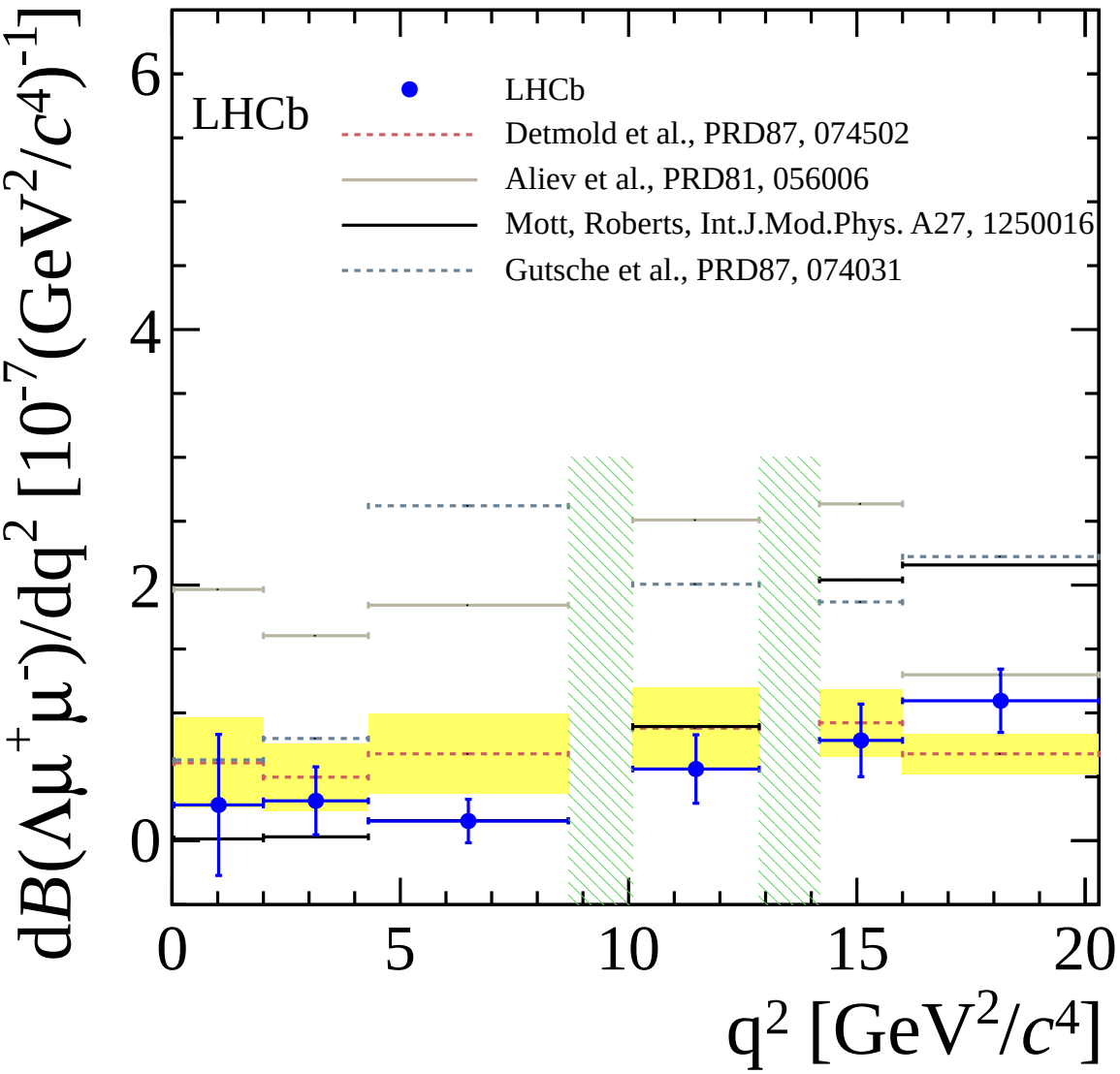

Figure 3: Differential branching fraction for the $\Lambda_b^0 \to \Lambda\mu^+\mu^-$ decay. The uncertainty arising due to components that are fully correlated across all q^2 bins, *e.g.* from the normalisation mode, are not included in this figure. The various lines show predictions from Refs. [3–6].

References

[1] CDF collaboration, *Precise measurements of exclusive $b \to s\mu\mu$ decay amplitudes using the full CDF data set*, CDF Public Note 10894.

[2] CDF collaboration, T. Aaltonen *et al.*, *Observation of the baryonic flavor-changing neutral current decay $\Lambda_b^0 \to \Lambda\mu^+\mu^-$*, Phys. Rev. Lett. **107** (2011) 201802, arXiv:1107.3753.

[3] W. Detmold, C.-J. D. Lin, S. Meinel, and M. Wingate, *$\Lambda_b^0 \to \Lambda\ell^+\ell^-$ form factors and differential branching fraction from lattice QCD*, Phys. Rev. **D87** (2013) 074502, arXiv:1212.4827.

[4] T. M. Aliev, K. Azizi, and M. Savci, *Analysis of the $\Lambda_b^0 \to \Lambda\ell^+\ell^-$ decay in QCD*, Phys. Rev. **D81** (2010) 056006, arXiv:1001.0227.

[5] L. Mott and W. Roberts, *Rare dileptonic decays of Λ_b^0 in a quark model*, Int. J. Mod. Phys. **A27** (2012) 1250016, arXiv:1108.6129.

[6] T. Gutsche *et al.*, *Rare baryon decays $\Lambda_b^0 \to \Lambda\ell^+\ell^-$ ($\ell = e,\ \mu,\ \tau$) and $\Lambda_b^0 \to \Lambda\gamma$: differential and total rates, lepton- and hadron-side forward-backward asymmetries*, Phys. Rev. **D87** (2013) 074031, arXiv:1301.3737.