Supplementary material for LHCb-PAPER-2015-023
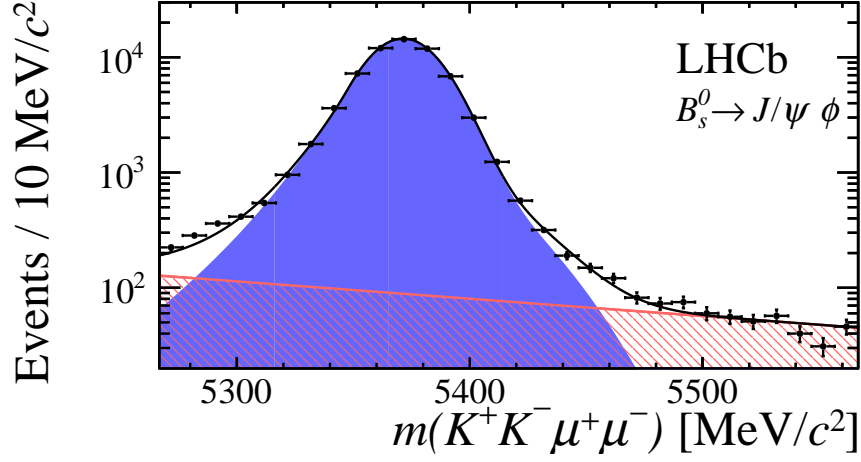

Figure 1: Invariant mass distribution for the control mode $B_s^0 \to J/\psi\,\phi$ in a logarithmic scale. The signal component is given by the solid blue area, the background component by the shaded red area.

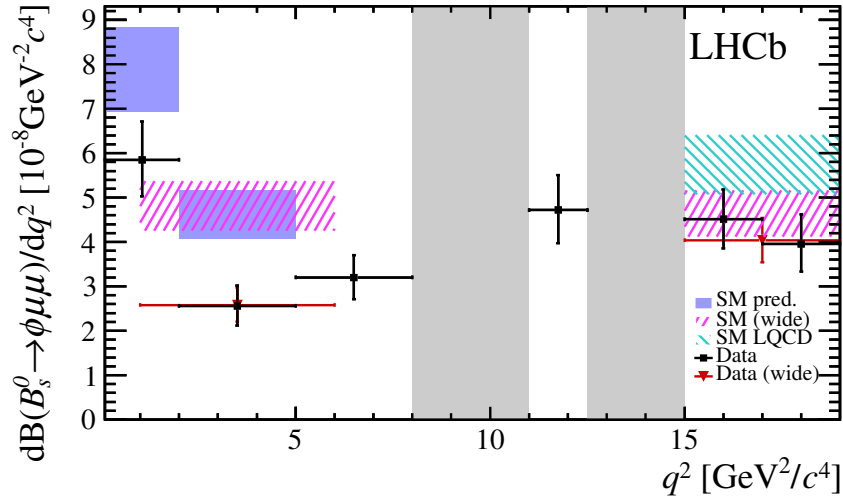Figure 2: Differential branching fraction of the decay $B_s^0 \to \phi\mu^+\mu^-$, overlaid with SM predictions [1,2] using form factors from a combined fit of light cone sum rule and lattice QCD calculations, indicated by blue and hatched magenta boxes. In addition, a SM prediction that exclusively uses the results from lattice calculations [3] is given by the hatched turquoise box. The vetoes excluding the charmonium resonances are indicated by grey areas.
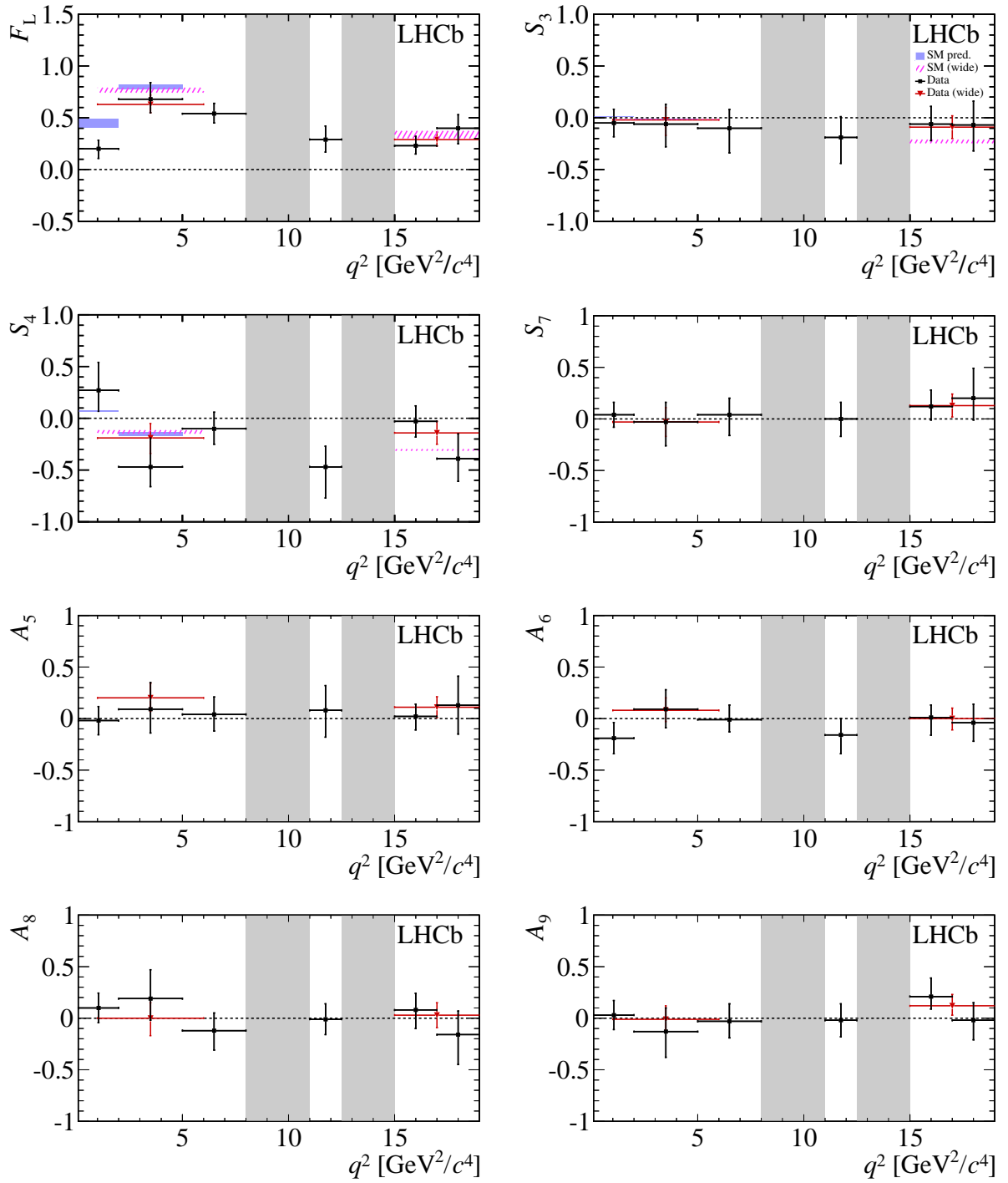
Figure 3: *CP*-averaged angular observables F_{L} and $S_{3,4,7}$ and *CP* asymmetries $A_{5,6,8,9}$ shown by black and red dots, overlaid with SM predictions [1,2], where available, indicated as blue and hatched magenta boxes. The vetoes excluding the charmonium resonances are indicated by grey areas.

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References

[1] W. Altmannshofer and D. M. Straub, *New physics in $b \to s$ transitions after LHC run 1*, Eur. Phys. J. **C75** (2015) 382, `arXiv:1411.3161`.

[2] A. Bharucha, D. M. Straub, and R. Zwicky, $B \to V \ell^+ \ell^-$ *in the Standard Model from light-cone sum rules*, `arXiv:1503.05534`.

[3] R. R. Horgan, Z. Liu, S. Meinel, and M. Wingate, *Calculation of $B^0 \to K^{*0} \mu^+ \mu^-$ and $B_s^0 \to \phi \mu^+ \mu^-$ observables using form factors from lattice QCD*, Phys. Rev. Lett. **112** (2014) 212003, `arXiv:1310.3887`.