

1 Supplementary material for LHCb-PAPER-2021-014

2 This appendix contains supplementary material that will be posted on the public CDS
3 record but will not appear in the paper.

Table 1: Number of $B_s^0 \rightarrow \phi\mu^+\mu^-$ candidates extracted from the simultaneous fits to all data sets. The given uncertainties are statistical only.

q^2 interval [GeV^2/c^4]	2011–2012 yield	2015–2016 yield	2017–2018 yield
0.1–0.98	55.7 ± 3.8	60.0 ± 4.1	130.7 ± 8.9
1.1–2.5	34.8 ± 3.2	37.3 ± 3.5	81.7 ± 7.6
2.5–4.0	28.8 ± 3.2	30.2 ± 3.3	65.3 ± 7.1
4.0–6.0	53.8 ± 4.2	54.7 ± 4.3	122.5 ± 9.7
6.0–8.0	57.2 ± 4.3	60.5 ± 4.6	135 ± 10
11.0–12.5	75.3 ± 4.8	83.7 ± 5.3	178 ± 11
15.0–17.0	96.6 ± 5.3	103.7 ± 5.7	226 ± 12
17.0–19.0	55.1 ± 3.8	52.2 ± 3.6	123.5 ± 8.6
1.1–6.0	117.4 ± 6.2	122.1 ± 6.5	269 ± 14
15.0–19.0	152.2 ± 6.6	157.6 ± 6.8	352 ± 15

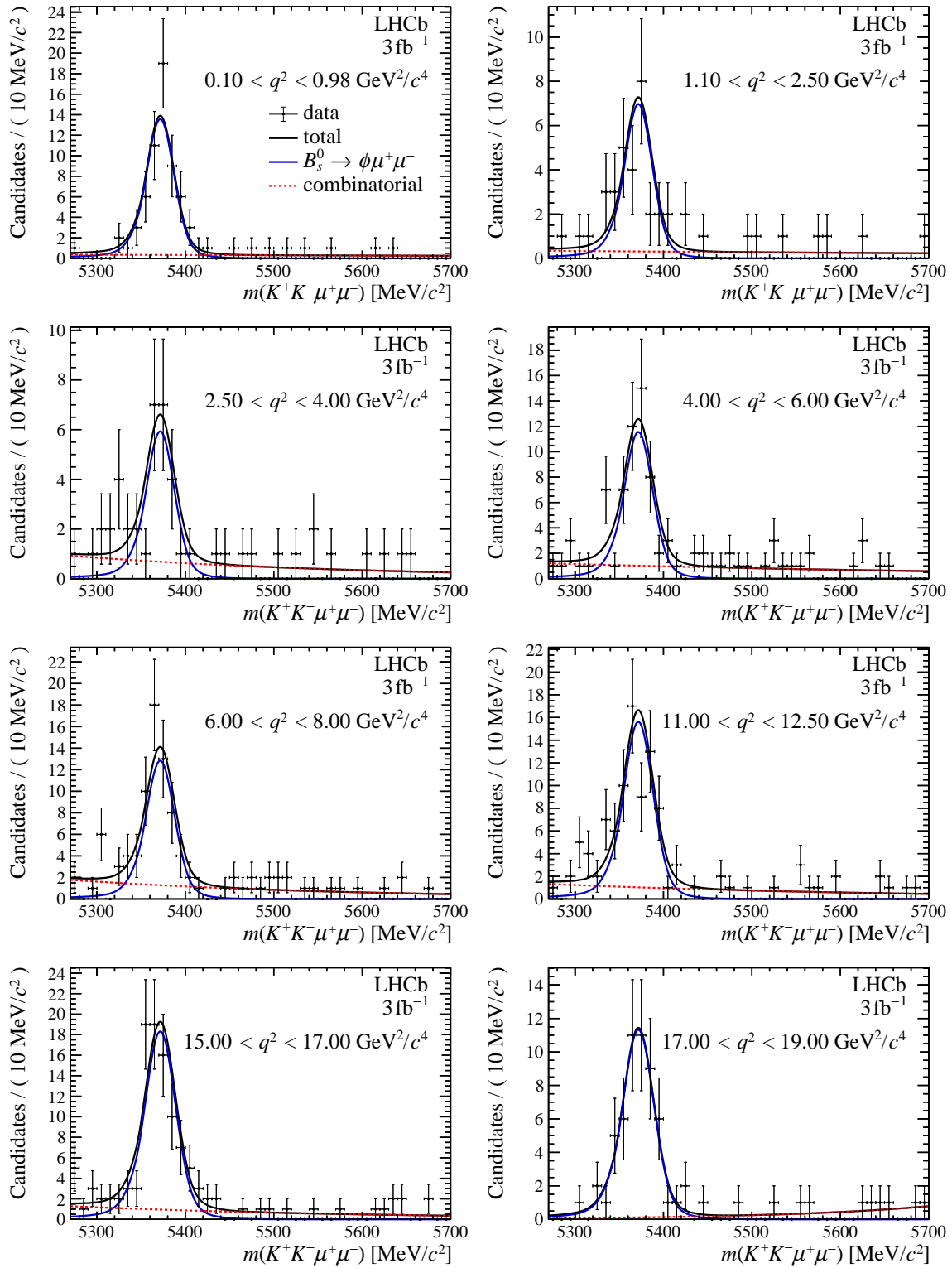


Figure 1: Reconstructed invariant mass of the $K^+K^-\mu^+\mu^-$ system for the decay $B_s^0 \rightarrow \phi\mu^+\mu^-$ in the narrow q^2 intervals for the 2011–2012 data-taking period.

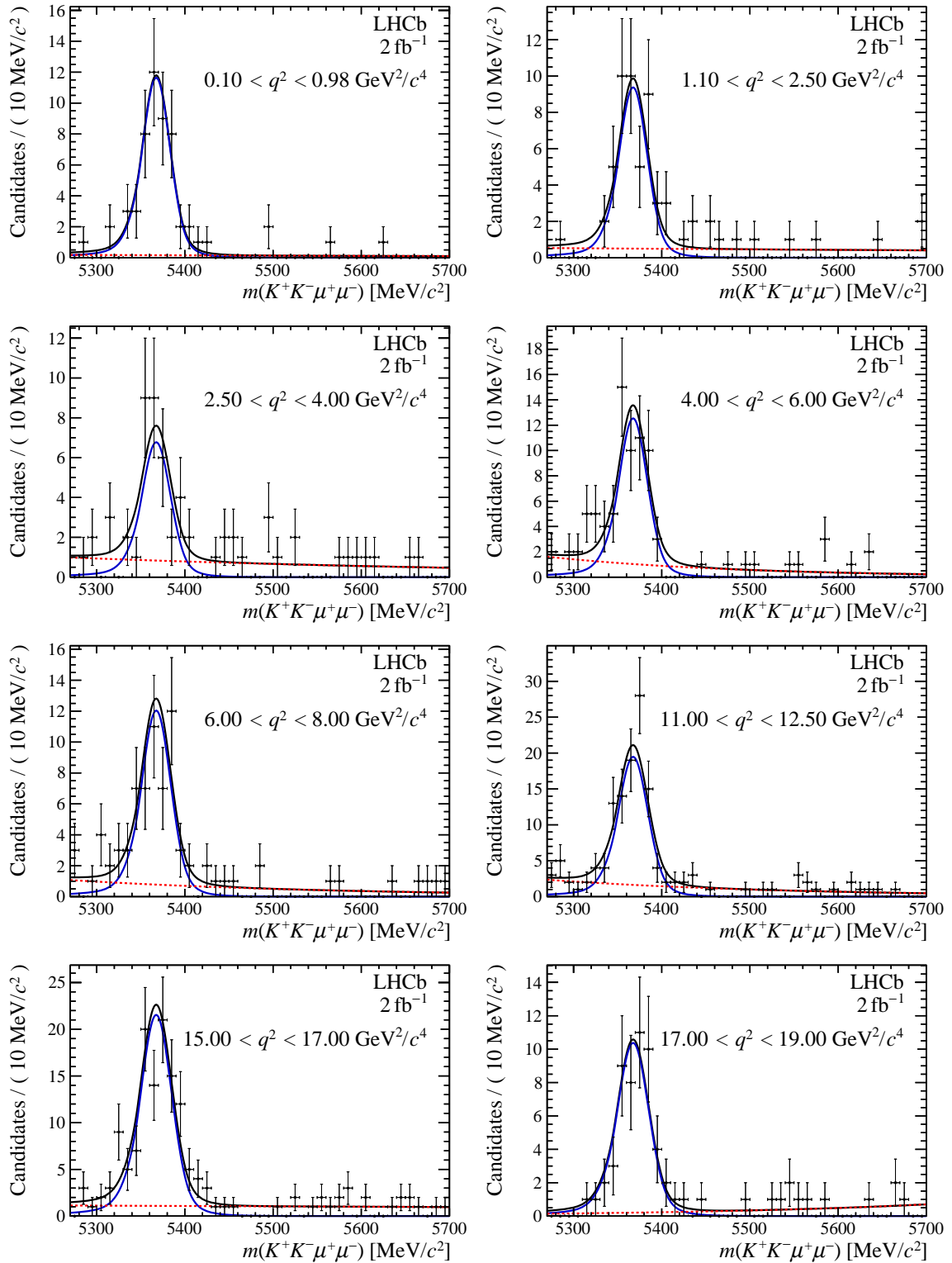


Figure 2: Reconstructed invariant mass of the $K^+K^-\mu^+\mu^-$ system for the decay $B_s^0 \rightarrow \phi\mu^+\mu^-$ in the narrow q^2 intervals for the 2015–2016 data-taking period.

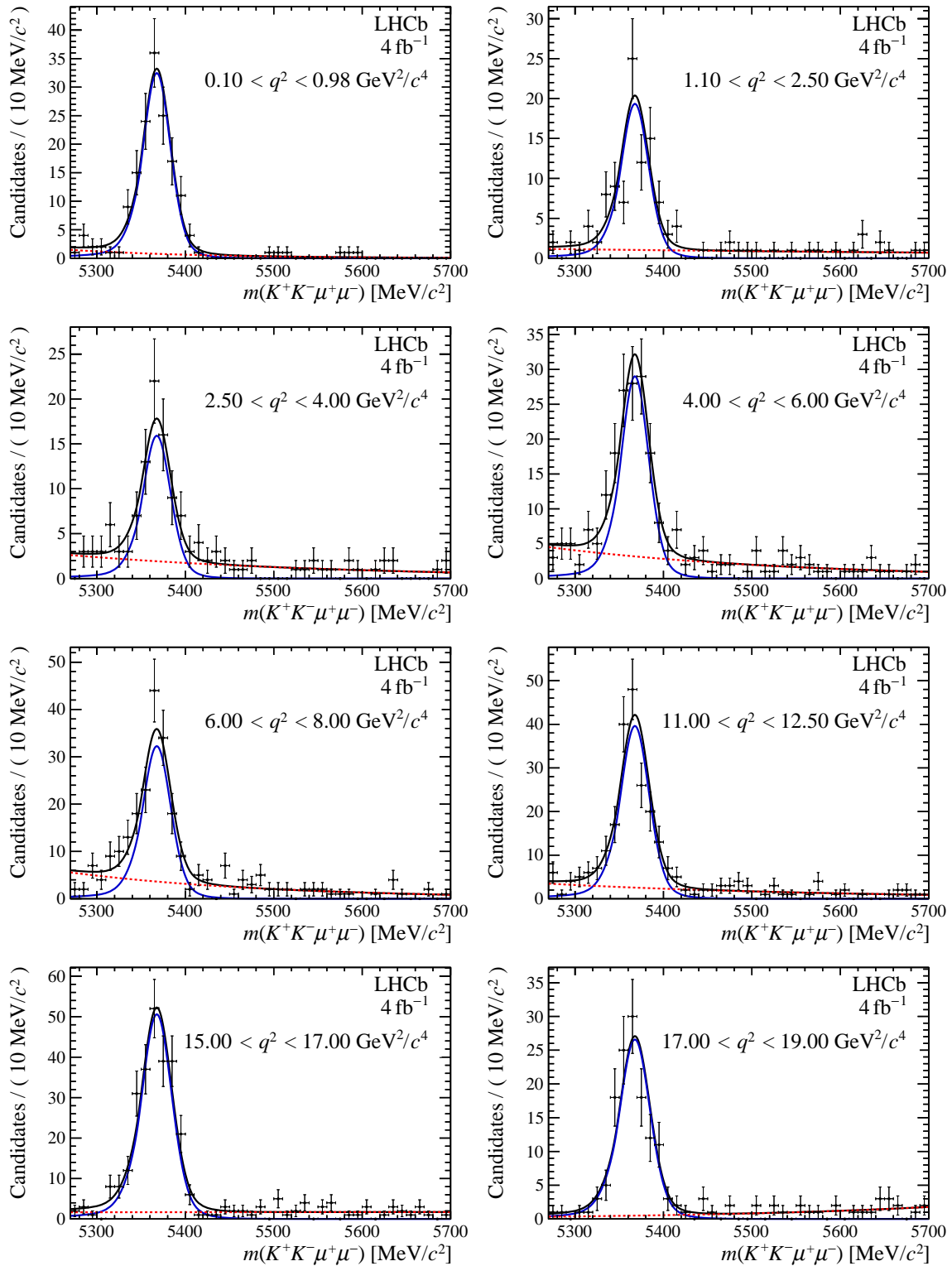


Figure 3: Reconstructed invariant mass of the $K^+K^-\mu^+\mu^-$ system for the decay $B_s^0 \rightarrow \phi\mu^+\mu^-$ in the narrow q^2 intervals for the 2017–2018 data-taking period.

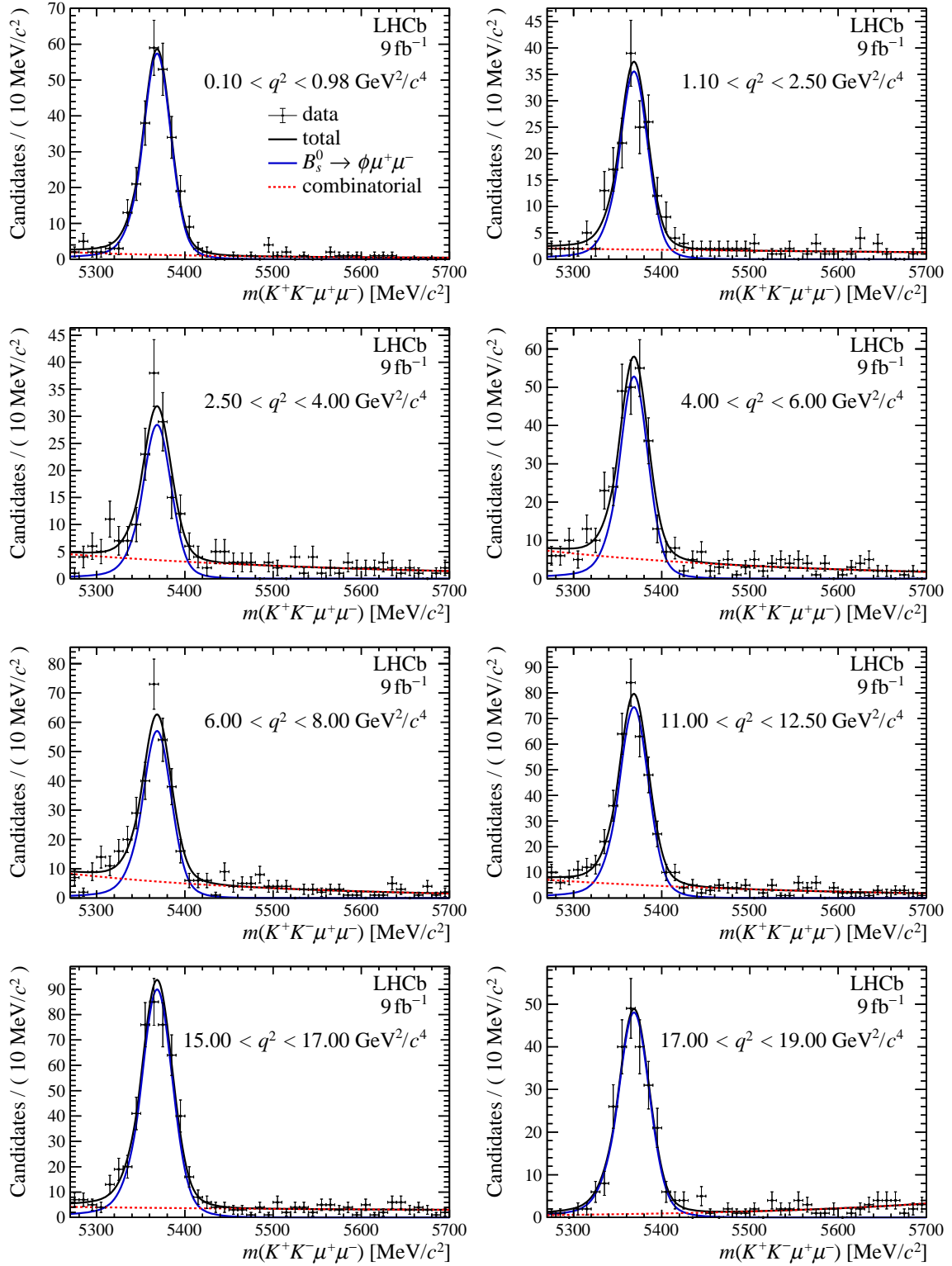


Figure 4: Reconstructed invariant mass of the $K^+K^-\mu^+\mu^-$ system for the decay $B_s^0 \rightarrow \phi\mu^+\mu^-$ in the narrow q^2 intervals for the combination of all data-taking periods.

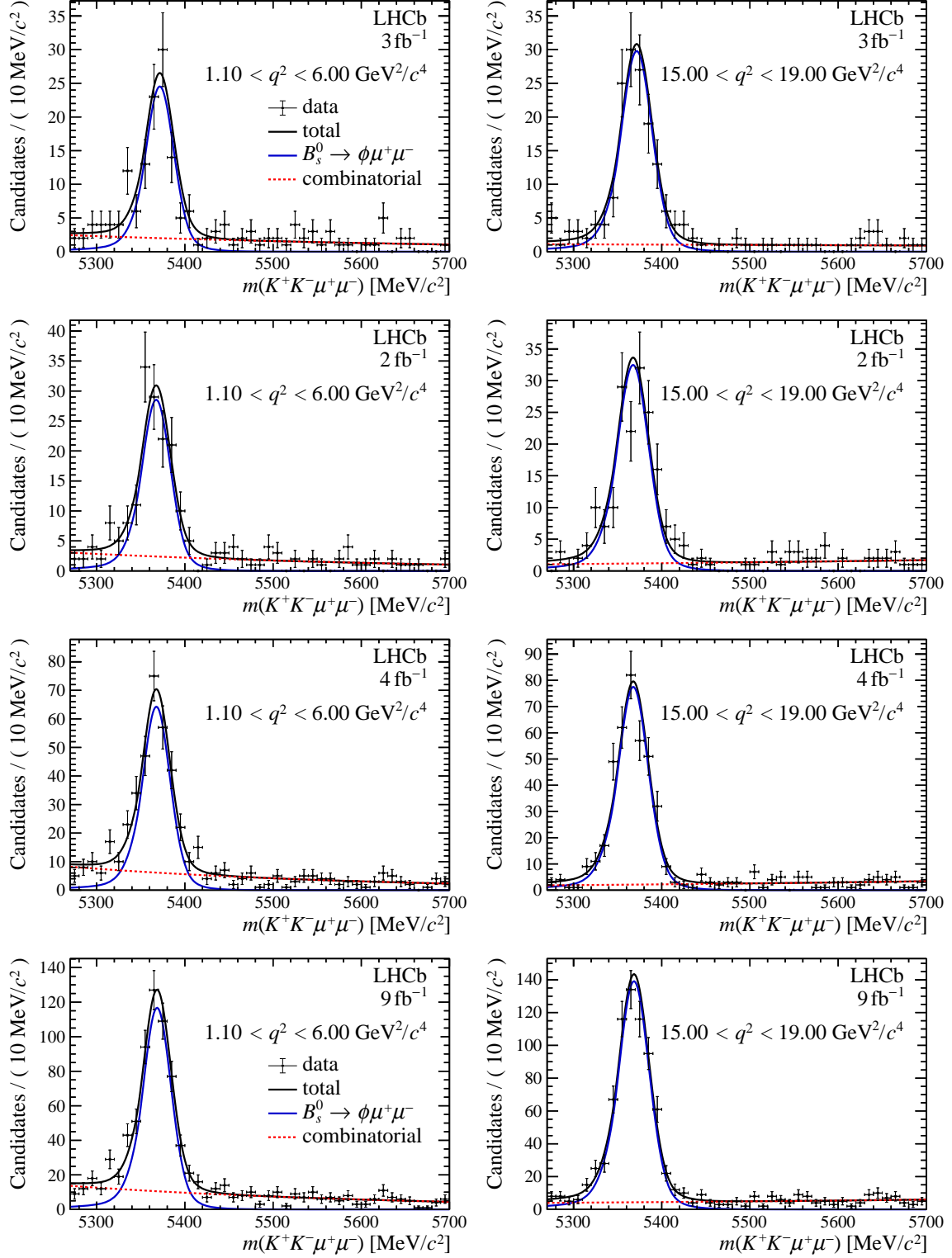


Figure 5: Reconstructed invariant mass of the $K^+K^-\mu^+\mu^-$ system for the decay $B_s^0 \rightarrow \phi\mu^+\mu^-$ in the wide q^2 intervals for the (top) 2011–2012, (top middle) 2015–2016, (bottom middle) 2017–2018 and (bottom) the combination of all data-taking periods.

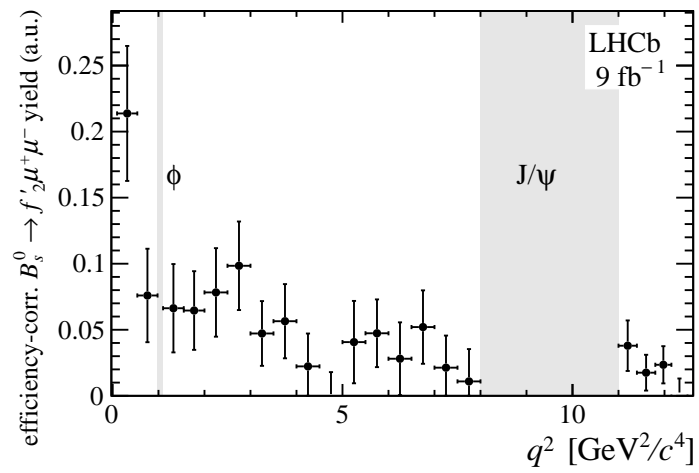


Figure 6: Normalised efficiency-corrected $B_s^0 \rightarrow f_2' \mu^+ \mu^-$ yields, combined across all data-taking periods between 2011–2018, as a function of the invariant dimuon mass squared, q^2 . The background has been statistically subtracted using the *sPlot* technique.