

# 1 Supplementary material

A measurement of  $M(B_s^0) - M(B^0)$  by the CDF collaboration is given in Ref. [?]. Measurements of  $M(B_s^0) - M(B^+)$  and  $M(B^0) - M(B^+)$  by the LHCb collaboration are given in Ref. [?]. The LHCb numbers can be used to calculate

$$M(B_s^0) - M(B^0) = 87.32 \pm 0.32 \text{ (stat)} \pm 0.08 \text{ (syst)} \text{ MeV}/c^2.$$

Figure 1 compares these results with the measurement reported in this Letter.

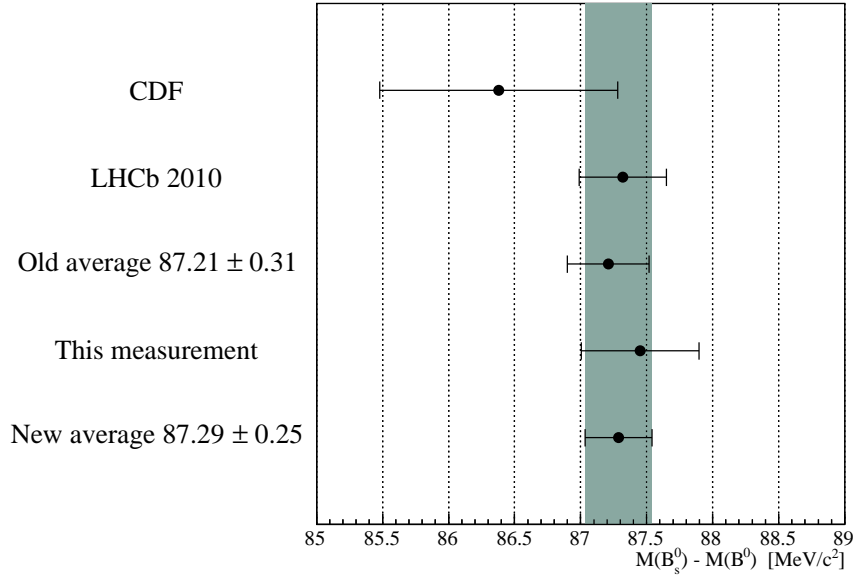


Figure 1: Measurements of  $M(B_s^0) - M(B^0)$  and averages of this quantity made using the PDG prescription [?]. The error bars show the quadrature sum of the statistical and systematic uncertainties of each measurement.

Figure 2 shows the distribution of  $m(\psi(2S)\pi^-)$  for the selected  $\bar{B}_s^0 \rightarrow \psi(2S)K^+\pi^-$  candidates in the signal window  $m(\psi(2S)K^+\pi^-) \in [5350, 5380] \text{ MeV}/c^2$ .

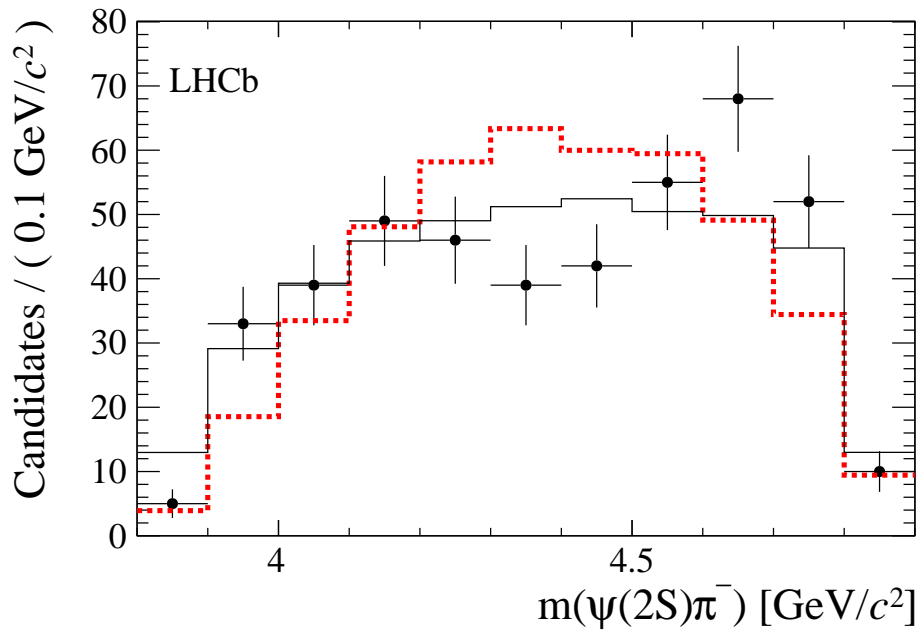


Figure 2: Distribution of  $m(\psi(2S)\pi^-)$  for the selected  $\bar{B}_s^0 \rightarrow \psi(2S)K^+\pi^-$  candidates (black points) in the signal window  $m(\psi(2S)K^+\pi^-) \in [5350, 5380] \text{ MeV}/c^2$ . The projection of the default amplitude fit model (phase space simulated events) is shown by the black solid (red dotted) histogram.