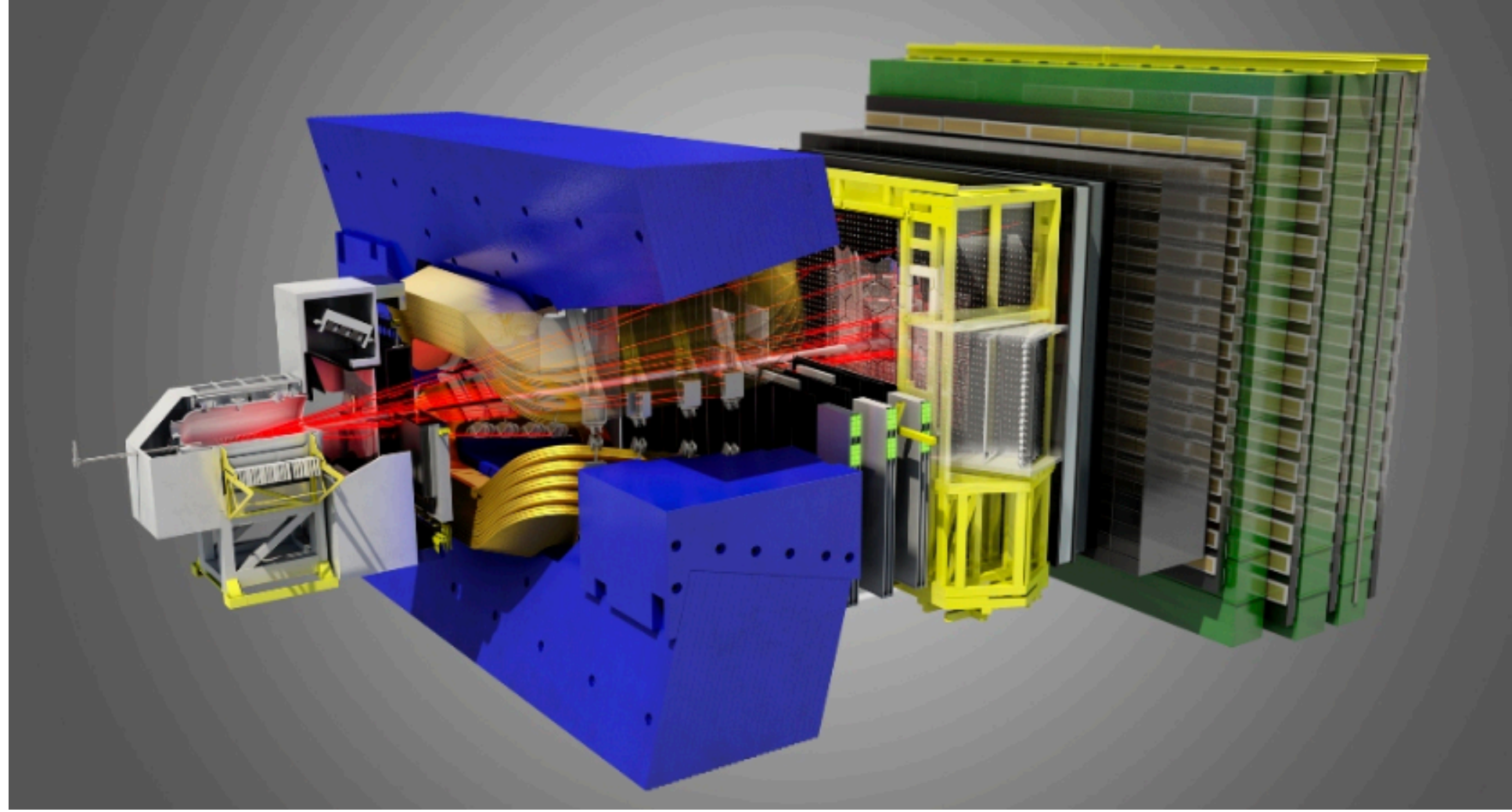


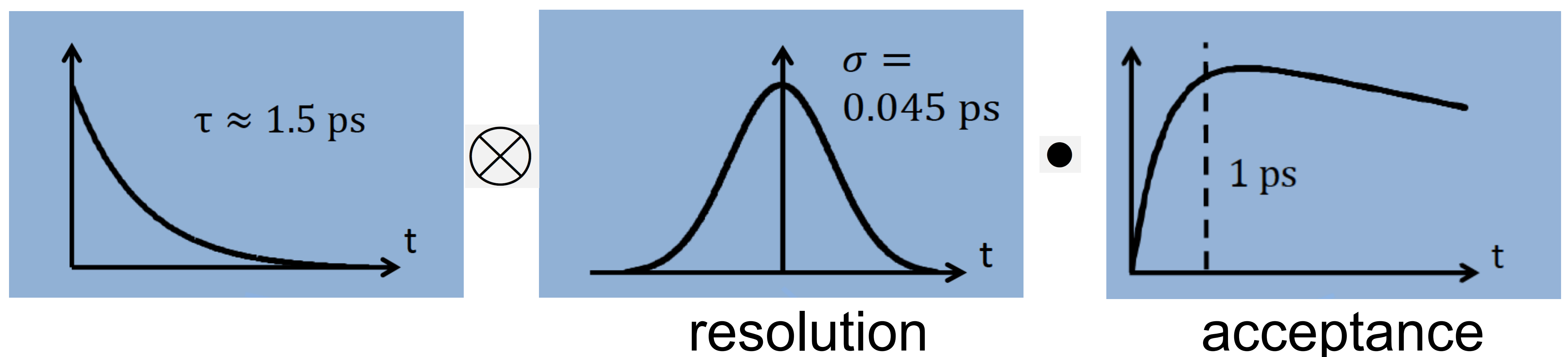
Measurement of b -hadron lifetimes at LHCb



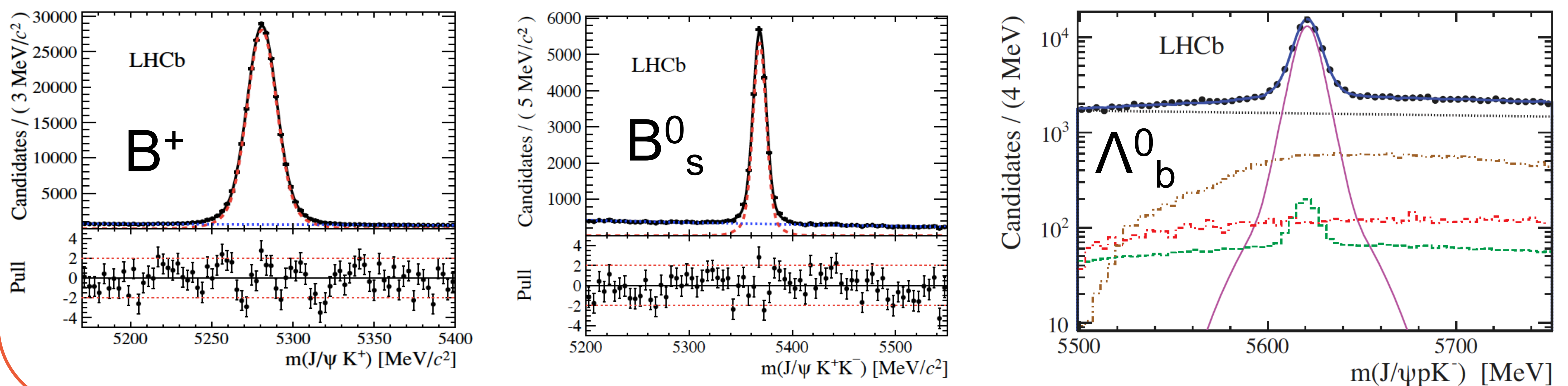
The LHCb detector

Lifetimes are among the most fundamental properties of elementary particles. Precision Measurements of b -hadron lifetimes are an important tool to test theoretical models such as HQET. These models allow to predict various observables related to B-mixing. Using data collected during Run 1 at the LHC, LHCb measured the lifetime of B-decays including a J/ψ in the final state.

Lifetime PDF:



Mass projection – signal/background separation

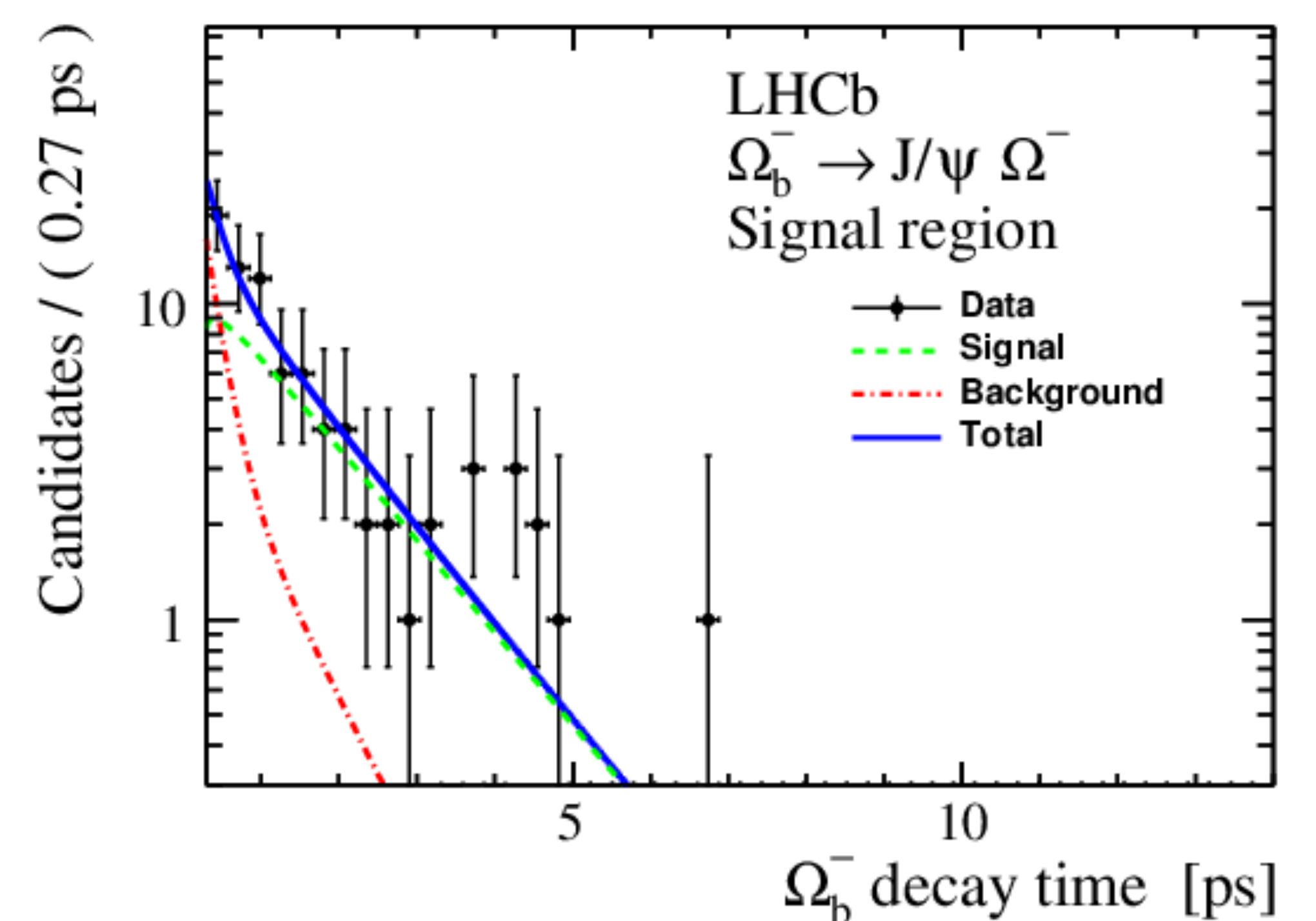


Final results

$$\begin{aligned} \tau(B^+) &= 1.637 \pm 0.004 \text{ (stat)} \pm 0.003 \text{ (syst)} \quad [1] \\ \tau(B^0) &= 1.542 \pm 0.006 \text{ (stat)} \pm 0.004 \text{ (syst)} \quad [1] \\ \tau(B_s^0) &= 1.480 \pm 0.011 \text{ (stat)} \pm 0.005 \text{ (syst)} \quad [1] \\ \tau(\Lambda_b^0) &= 1.479 \pm 0.009 \text{ (stat)} \pm 0.010 \text{ (syst)} \quad [2] \\ \tau(\Xi_b^-) &= 1.55^{+0.10}_{-0.09} \text{ (stat)} \pm 0.03 \text{ (syst)} \quad [3] \\ \tau(\Omega_b^-) &= 1.54^{+0.26}_{-0.21} \text{ (stat)} \pm 0.05 \text{ (syst)} \quad [3] \end{aligned}$$

Most precise measurements to date !

Lifetime projection



References :

- [1] LHCb Collaboration, arxiv:1402.2554
- [2] LHCb Collaboration, arxiv:1402.6242
- [3] LHCb Collaboration, arxiv:1405.1543

