

Supplementary material for LHCb-PAPER-2021-018

Fit of null hypothesis model

The fit projections for the null hypothesis model is reported in Fig. 1. The model comprises a non-resonant component in the X decay chain with quantum numbers equal to $J^{PC} = 1^{--}$, plus a background contribution.

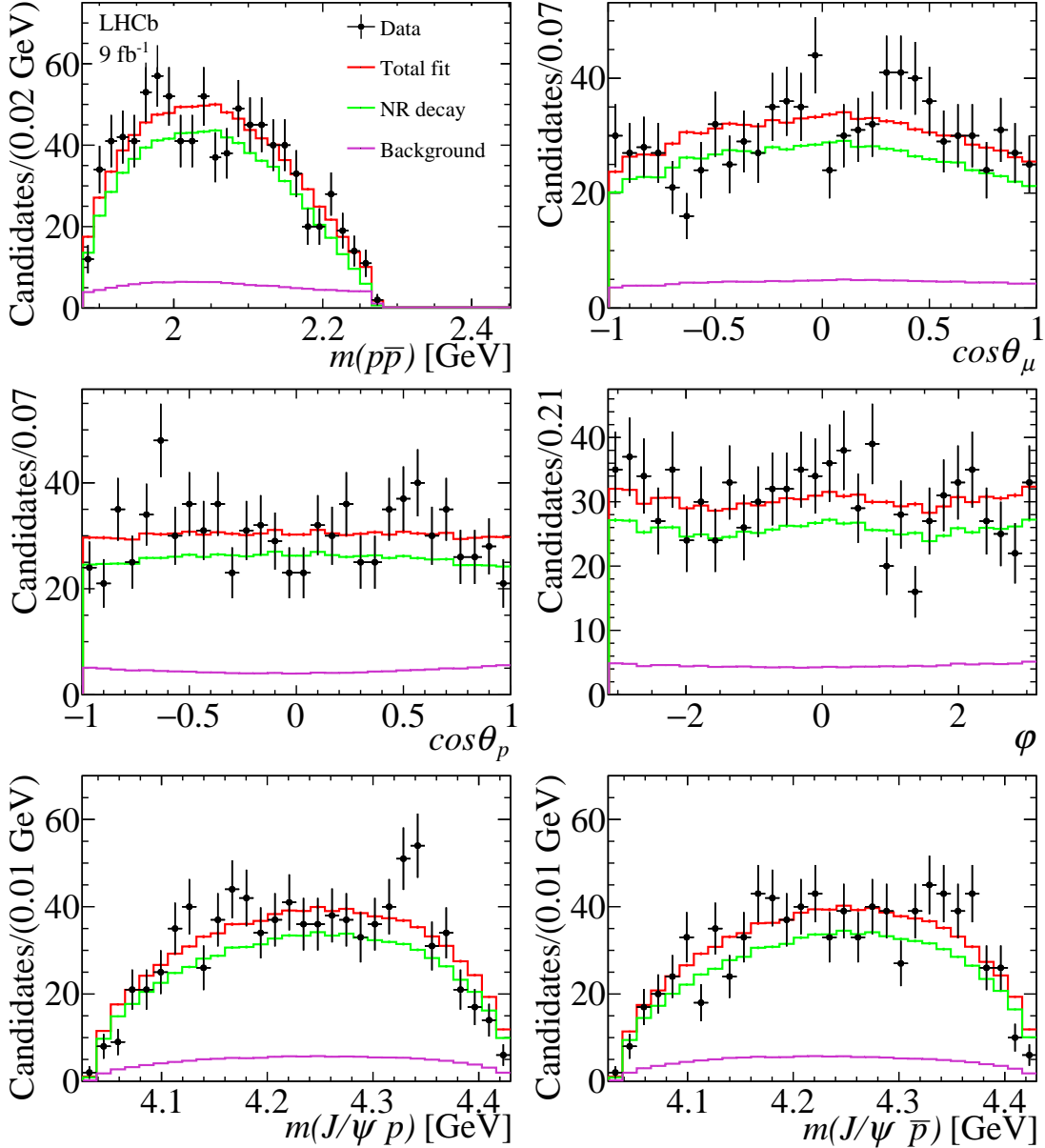


Figure 1: One-dimensional distributions of kinematic variables for the null hypothesis fit.

Goodness-of-fit test

The goodness-of-fit is estimated performing a χ^2 test in the Dalitz-plot variables of the $m^2(J/\psi p)$ and $m^2(J/\psi \bar{p})$ invariant masses. The number of intervals is chosen to be 40

to ensure at least 20 events per interval. The effective number of degrees of freedom is extracted from pseudoexperiments with a χ^2 fit to the χ^2 distribution, as shown in Fig. 2, resulting in $ndf = 36.8 \pm 0.3$. The χ^2/ndf for the default model with $J^P = 1/2^+$ of the P_c^+ state is equal to 0.998 ± 0.008 .

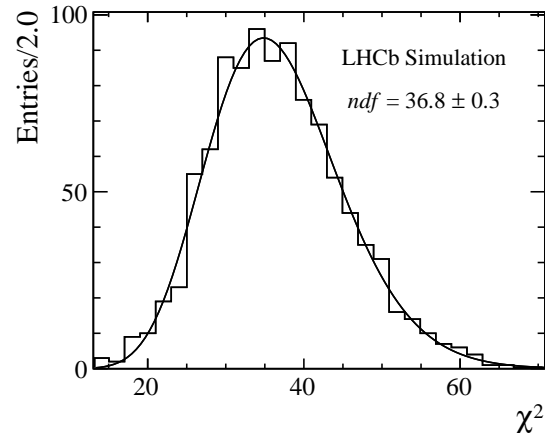


Figure 2: Distribution of χ^2 for the pseudoexperiments used to extract the number of degrees of freedom.