

## Supplementary plots for LHCb-PAPER-2013-030

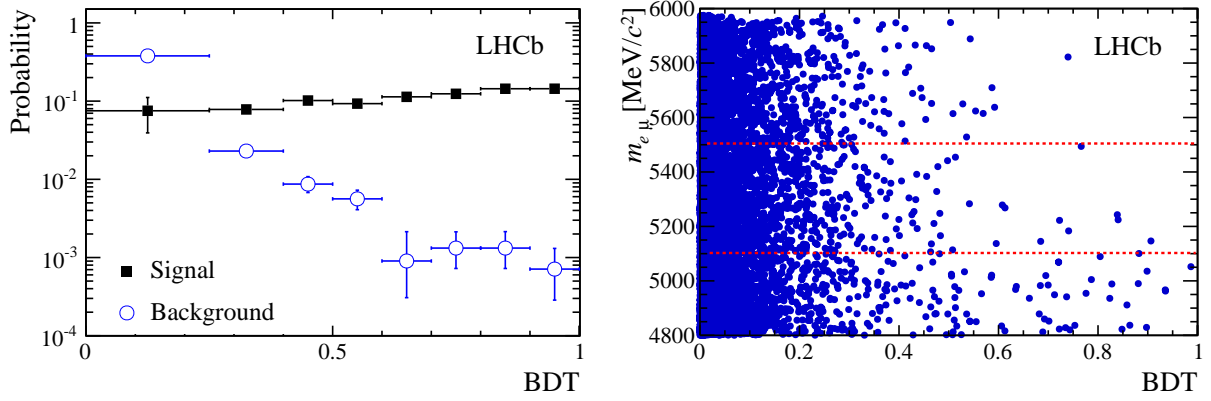


FIG. 1. Left: binned BDT distribution for signal (black squares) and combinatorial background (blue circles). Right: Distribution of observed candidates in the two-dimensional plane formed by the electron-muon invariant mass and the BDT output. The red dashed lines define the signal mass region.

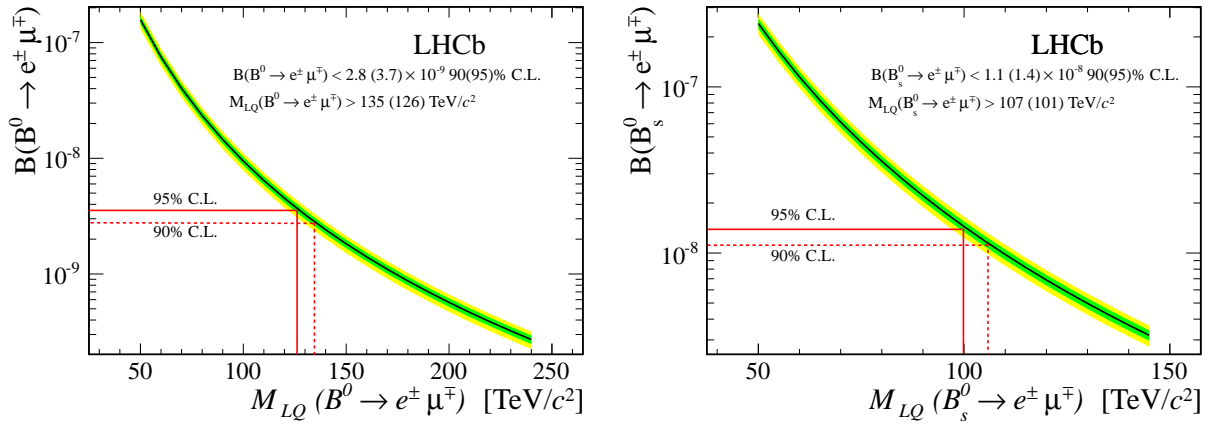


FIG. 2. Branching fraction as a function of the leptoquark mass for (left)  $B^0 \rightarrow e^\pm \mu^\mp$  and (right)  $B_s^0 \rightarrow e^\pm \mu^\mp$  for leptoquarks linking the  $\tau$  lepton (left) to the second and first quark (right) generation, respectively.

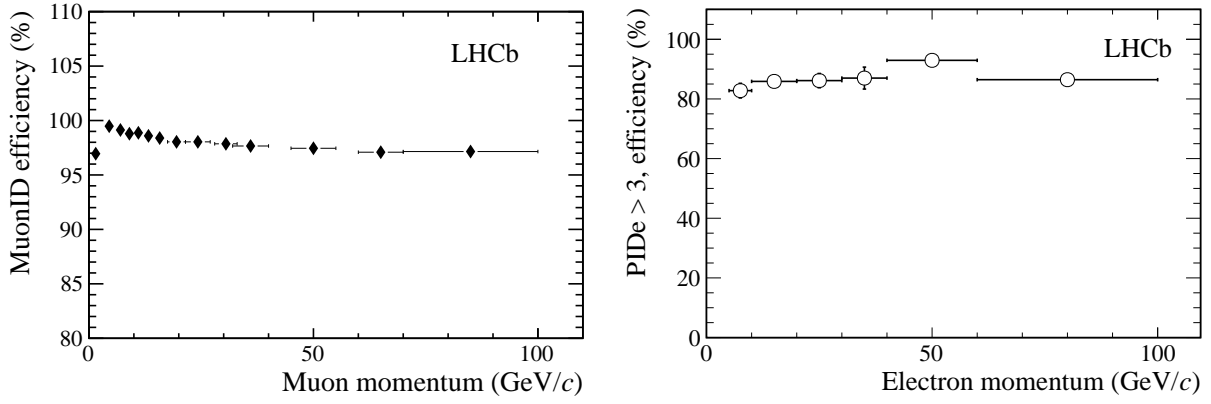


FIG. 3. Left: muon identification efficiency as a function of muon momentum. Right: electron identification efficiency as a function of electron momentum.

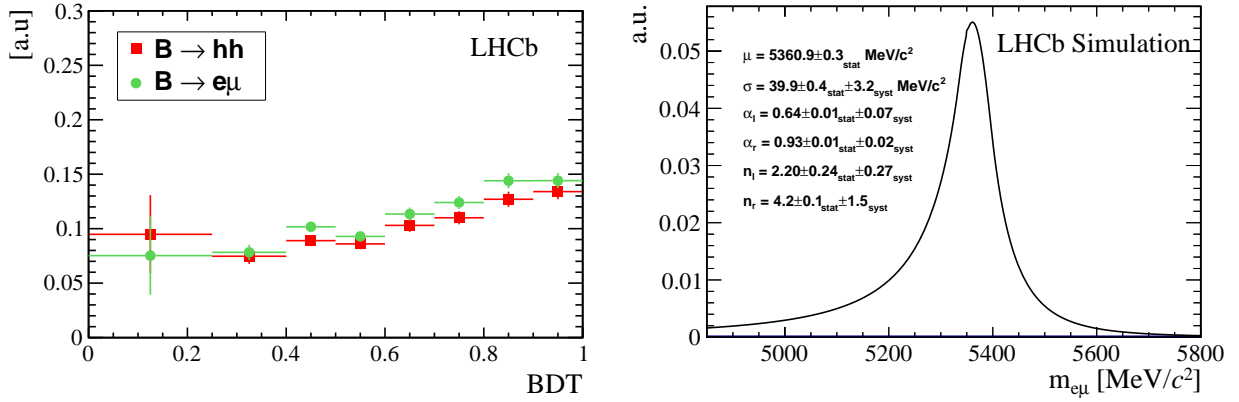


FIG. 4. (Left) BDT distribution and (right) mass distribution for  $B_s^0 \rightarrow e^\pm \mu^\mp$  candidates.

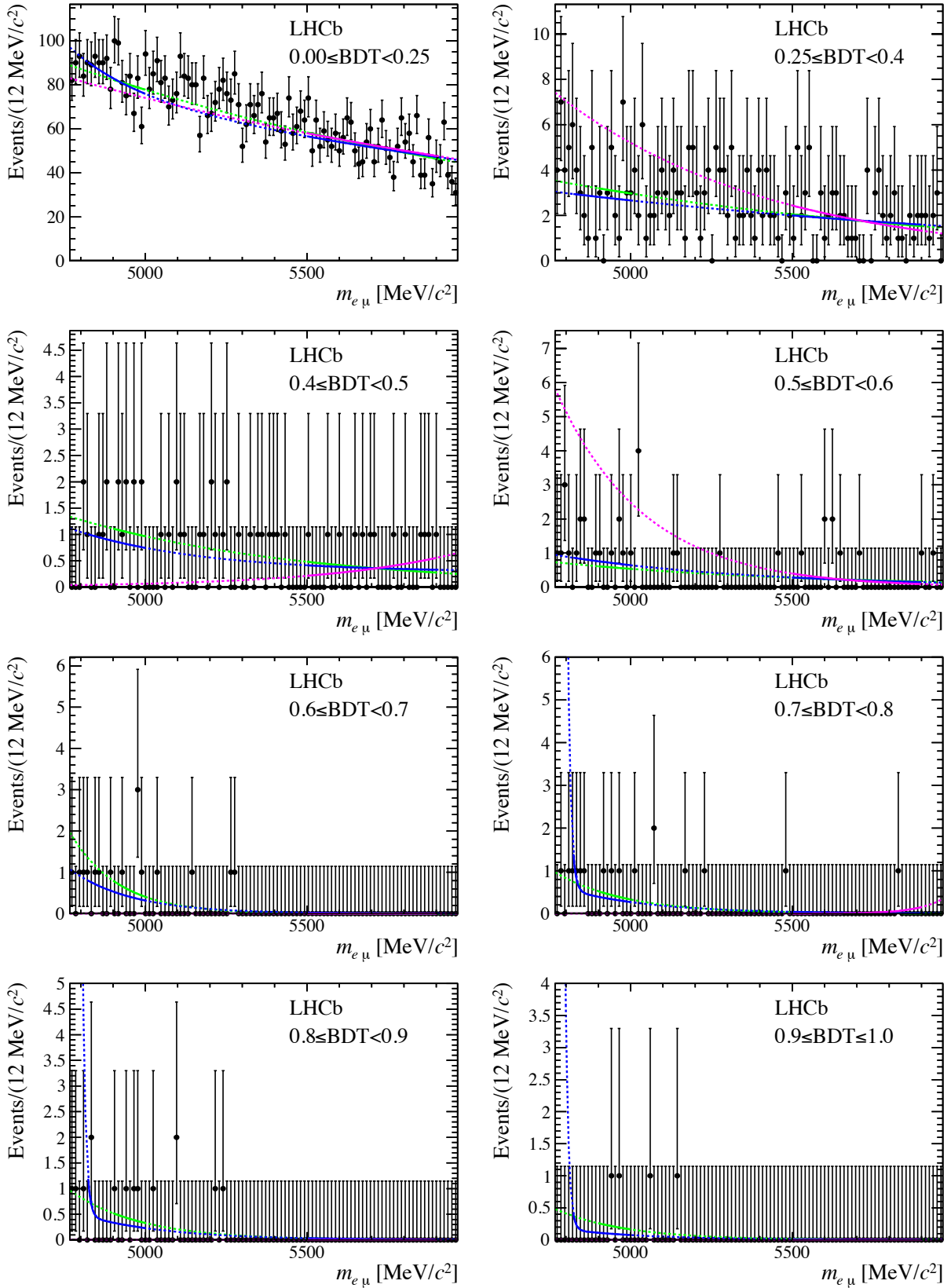


FIG. 5. Invariant mass distribution of selected candidates in BDT bins (bin 1: top left, bin 8: bottom right) with different fit models superimposed: single exponential model (light green), double exponential model (blue) and single exponential model fitted only to the right sideband (purple).