A   Supplementary material for LHCb-PAPER-2014-054

Figure 6 shows the distribution of p-values for the eight subsamples of the control channel $D^0 \to K^- \pi^+ \pi^0$. This confirms that there is no indication of local asymmetries in these samples.

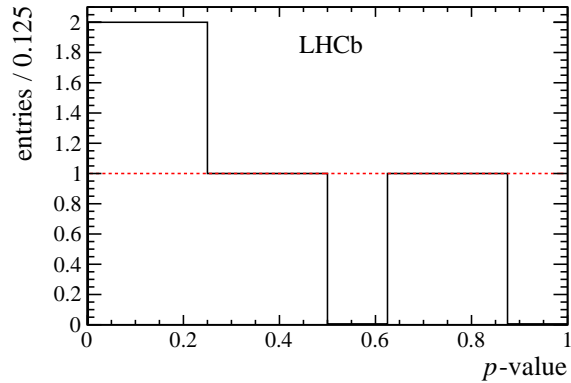Figure 6: Distribution of p-values for the eight subsamples of the control channel $D^0 \to K^- \pi^+ \pi^0$. The dashed line indicates the expected distribution.

Figures 7 and 8 show the permutation T_i value distributions and local asymmetry significances for different values of the metric parameter σ for CP violation scenarios with a 2% amplitude change and a $2°$ phase change of the ρ^+ resonance, respectively.
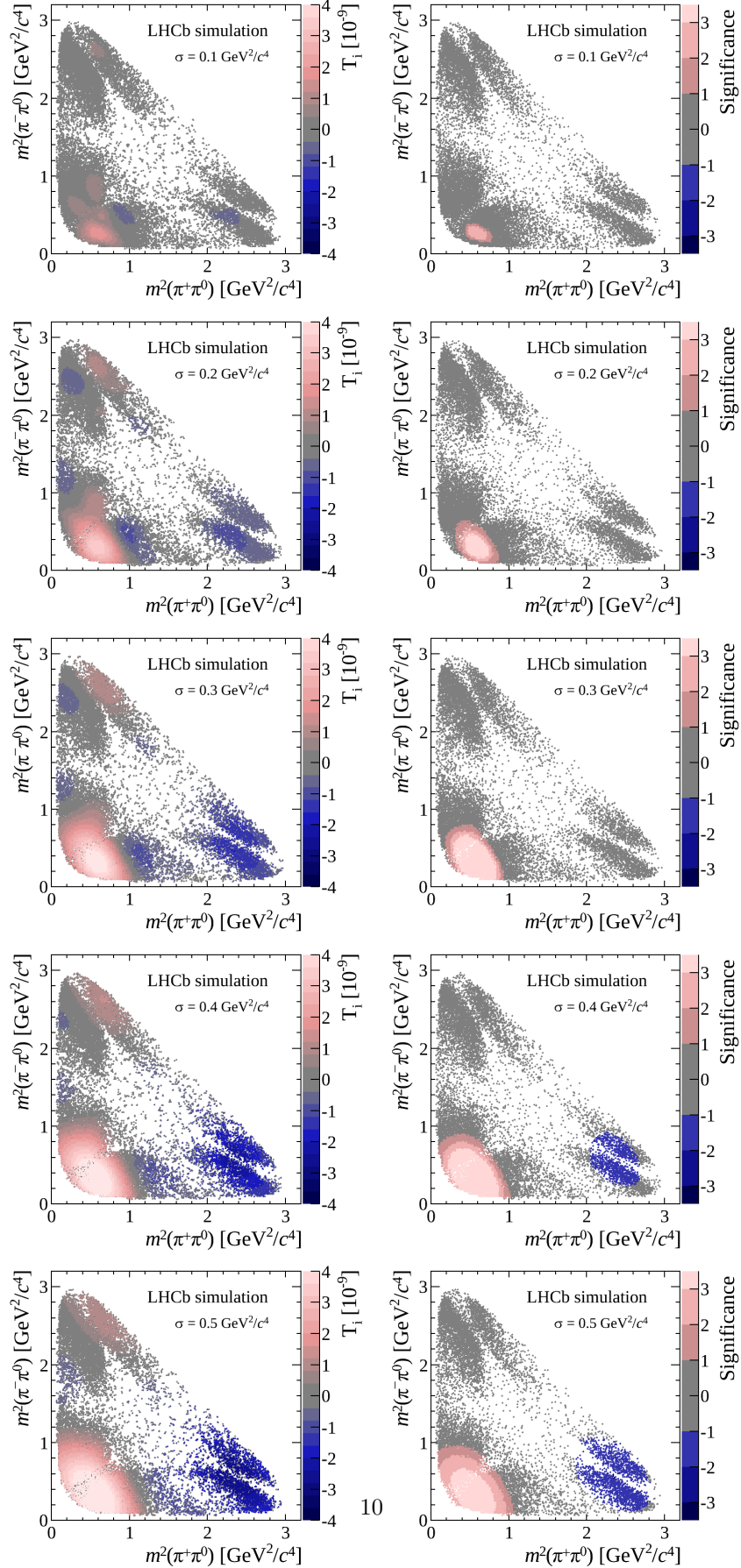
Figure 7: (Left) T_i value distributions and (right) local asymmetry significances for a 2% amplitude *CP* violation of the ρ^+ resonance with metric parameter σ values (from top to bottom) of 0.1, 0.2, 0.3, 0.4, 0.5 GeV^2/c^4.
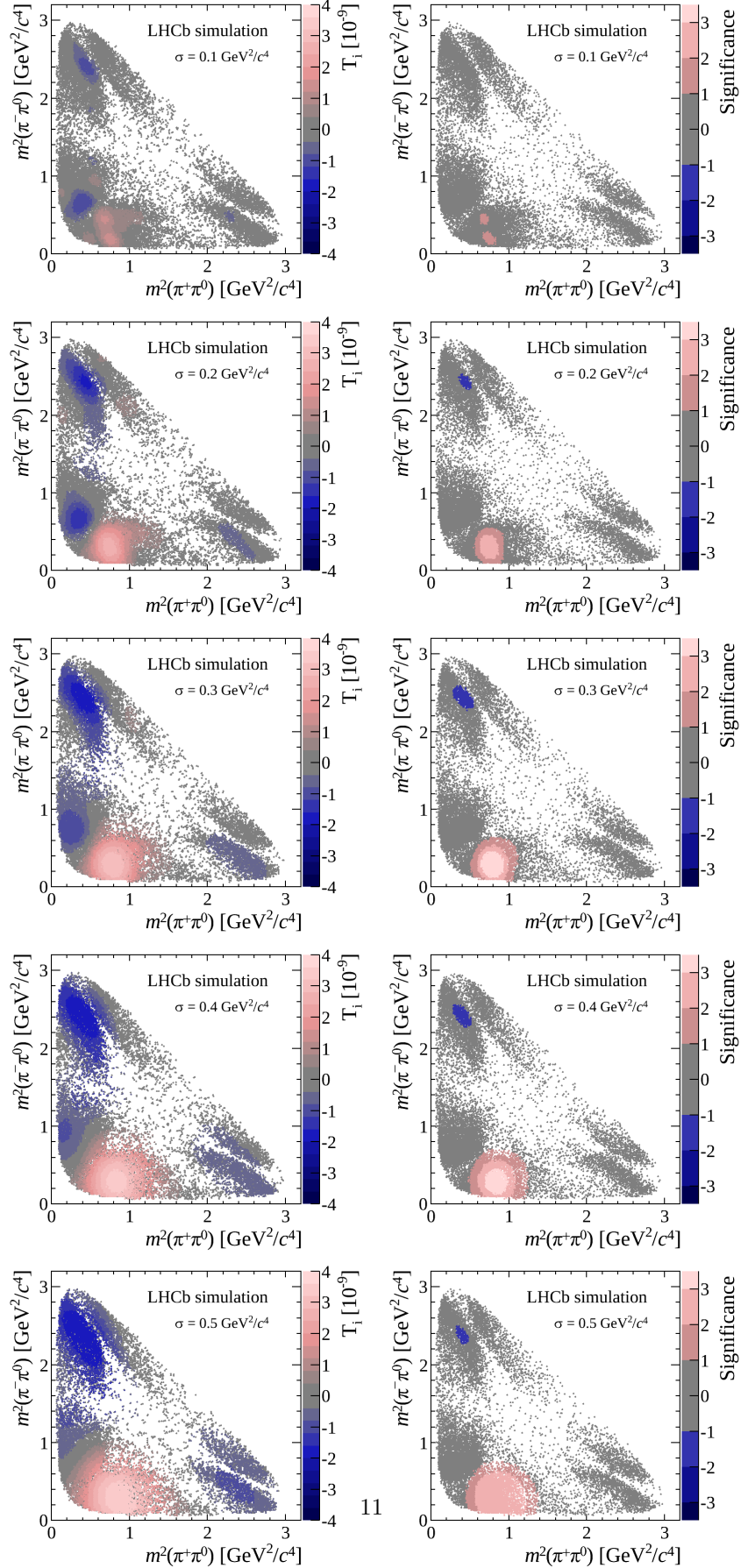
Figure 8: (Left) T_i value distributions and (right) local asymmetry significances for a 1° phase CP violation of the ρ^+ resonance with metric parameter σ values (from top to bottom) of 0.1, 0.2, 0.3, 0.4, 0.5 GeV^2/c^4.

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Dalitz plot binning	p-value
uniform 6x6	2.42×10^{-2}
uniform 8x8	8.44×10^{-2}
uniform 10x10	7.69×10^{-2}

Table 3: Results from applying the S_{CP} method to the $D^0 \to \pi^-\pi^+\pi^0$ signal region events

Figure 9 shows the results of the S_{CP} method [13] for the signal sample. The plots show the local asymmetry significances in different regions of phase space and their distribution compared to a normal distribution, which is what is expected in the case of CP conservation. The p-values for no CP violation hypothesis tested for various Dalitz plot binnings are summarized in Table 3.
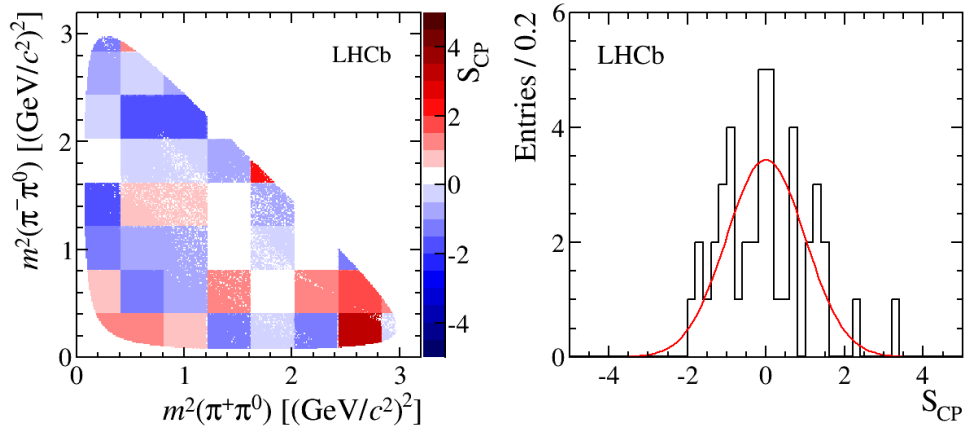

Figure 9: S_{CP} results for the signal sample (left) in the Dalitz distribution divided into 8×8 uniform bins and (right) the distribution of the asymmetry significances with a normal distribution fitted to the data.