

**Supplementary material for LHCb-PAPER-2014-069**

This appendix contains supplementary material that will be posted on the public CDS record but will not appear in the paper.

The LHCb average of the muon-tagged results presented in this paper and the pion-tagged results in Ref. [1] is

\[
\begin{align*}
\text{LHCb:} & \quad A_{\Gamma}(K^-K^+) = (-0.072 \pm 0.050)\%, \\
& \quad A_{\Gamma}(\pi^-\pi^+) = (-0.010 \pm 0.087)\%, 
\end{align*}
\]

which uses the fact that there is no correlation between the muon-tagged and pion-tagged results. Accounting again for the correlation in the systematic uncertainties between the \(D^0 \to K^-K^+\) and \(D^0 \to \pi^-\pi^+\) results, the LHCb average of \(A_{\Gamma}\) becomes

\[
\text{LHCb:} \quad A_{\Gamma} = (-0.056 \pm 0.044)\%.
\]

Combining this with the \(A_{\Gamma}\) measurements by from BaBar [2], Belle [3], and CDF [4], the world average becomes

\[
\text{World average:} \quad A_{\Gamma} = (-0.058 \pm 0.040)\%.
\]

An overview of the current measurements of \(A_{\Gamma}\) is shown in Fig. [1].
Figure 1: Overview of $A_\Gamma$ measurements in $D^0 \to K^- K^+$ and $D^0 \to \pi^- \pi^+$ decays. The results are shown from BaBar \cite{2}, Belle \cite{3}, CDF \cite{4}, LHCb (pion tagged) \cite{1} and this paper (LHCb, muon tagged). The measurements from BaBar and Belle make no distinction between $K^- K^+$ and $\pi^- \pi^+$ final states. The average of all $A_\Gamma$ measurements, combining the results for $D^0 \to K^- K^+$ and $D^0 \to \pi^- \pi^+$ decays, is also indicated.
References

[1] LHCb collaboration, R. Aaij et al., Measurements of indirect CP asymmetries in $D^0 \to K^{-}K^{+}$ and $D^0 \to \pi^{-}\pi^{+}$ decays, Phys. Rev. Lett. 112 (2014) 041801, arXiv:1310.7201


[4] CDF collaboration, T. A. Aaltonen et al., Measurement of indirect CP-violating asymmetries in $D^0 \to K^{+}K^{-}$ and $D^0 \to \pi^{+}\pi^{-}$ decays at CDF, Phys. Rev. D90 (2014) 111103, arXiv:1410.5435