

## 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

$$\text{LHCb: } \begin{aligned} A_\Gamma(K^-K^+) &= (-0.072 \pm 0.050)\% , \\ A_\Gamma(\pi^-\pi^+) &= (-0.010 \pm 0.087)\% , \end{aligned}$$

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  $D^0 \rightarrow K^-K^+$  and  $D^0 \rightarrow \pi^-\pi^+$  results, the LHCb average of  $A_\Gamma$  becomes

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

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

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

An overview of the current measurements of  $A_\Gamma$  is shown in Fig. 1.

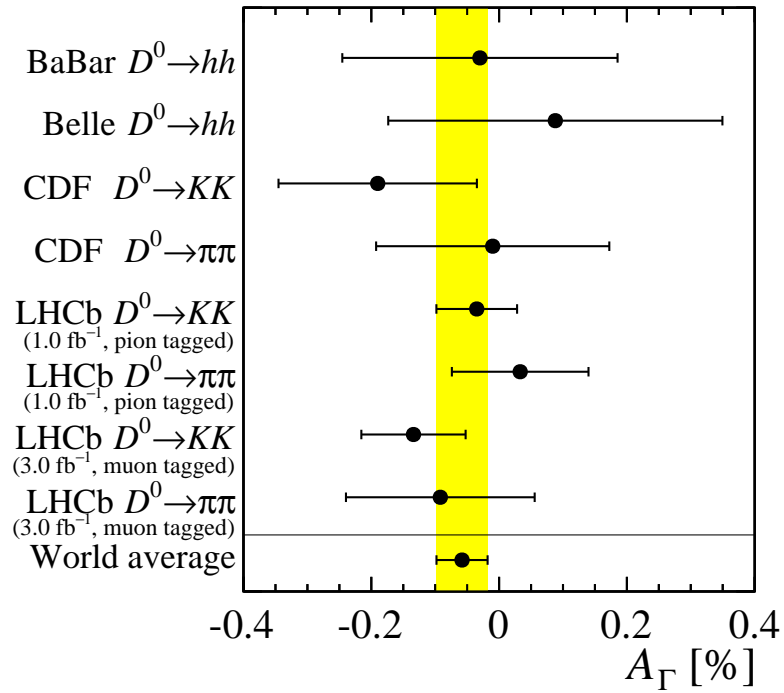


Figure 1: Overview of  $A_\Gamma$  measurements in  $D^0 \rightarrow K^-K^+$  and  $D^0 \rightarrow \pi^-\pi^+$  decays. The results are shown from BaBar [2], Belle [3], CDF [4], LHCb (pion tagged) [1] and this paper (LHCb, muon tagged). The measurements from BaBar and Belle make no distinction between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

## References

- [1] LHCb collaboration, R. Aaij *et al.*, *Measurements of indirect CP asymmetries in  $D^0 \rightarrow K^-K^+$  and  $D^0 \rightarrow \pi^-\pi^+$  decays*, Phys. Rev. Lett. **112** (2014) 041801, [arXiv:1310.7201](#).
- [2] BaBar collaboration, J. P. Lees *et al.*, *Measurement of  $D^0$ - $\bar{D}^0$  mixing and CP violation in two-body  $D^0$  decays*, Phys. Rev. **D87** (2013) 012004, [arXiv:1209.3896](#).
- [3] Belle collaboration, M. Staric, *New Belle results on  $D^0$ - $\bar{D}^0$  mixing*, [arXiv:1212.3478](#).
- [4] CDF collaboration, T. A. Aaltonen *et al.*, *Measurement of indirect CP-violating asymmetries in  $D^0 \rightarrow K^+K^-$  and  $D^0 \rightarrow \pi^+\pi^-$  decays at CDF*, Phys. Rev. **D90** (2014) 111103, [arXiv:1410.5435](#).