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# Erratum: Inclusive semileptonic $\Lambda_b$ decays in the Standard Model and beyond

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## 1 Correction of a typo in eq. (B.46) of appendix B of [1]

In appendix B, in eq. (B.46) there is a missing $m_b$ in the denominator of the third term. The correct eq. (B.46) reads:

$$\begin{aligned} T_{T11} = 2m_H \Bigg\{ & \frac{2}{\Delta_0} + \frac{2}{3m_b^2\Delta_0^2}\Big[5m_b(v\cdot q)\left(\hat{\mu}_\pi^2 - \hat{\mu}_G^2\right) + 6m_b^2\hat{\mu}_G^2 \\ & + 2(3m_b - 2v\cdot q)\left(\hat{\rho}_D^3 + \hat{\rho}_{LS}^3\right)\Big] \\ & - \frac{8}{3m_b\Delta_0^3}\Big[m_b[q^2 - (v\cdot q)^2]\,\hat{\mu}_\pi^2 - v\cdot q(m_b - v\cdot q)\hat{\rho}_D^3 + (m_b - v\cdot q)^2\,\hat{\rho}_{LS}^3\Big] \\ & - \frac{16}{3\Delta_0^4}(m_b - v\cdot q)[q^2 - (v\cdot q)^2]\hat{\rho}_D^3\Bigg\}. \end{aligned}$$

## 2 Correction of typos in eq. (C.23) of appendix C of [1]

In appendix C, in eq. (C.23) the signs in the r.h.s. are incorrect. The correct eq. (C.23) reads:

- R – P interference:

$$\begin{aligned} \mathcal{C}_0^{(RP)} &= -2\,\mathcal{C}_{\mu_\pi^2}^{(RP)} = -\mathcal{C}_0^{(SMP)} \\ \mathcal{C}_{\mu_G^2}^{(RP)} &= -\mathcal{C}_{\mu_G^2}^{(SMP)} \\ \mathcal{C}_{\hat{\rho}_D^3}^{(RP)} &= -\mathcal{C}_{\hat{\rho}_D^3}^{(SMP)} \end{aligned}$$



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## 3 Correction of eq. (C.5) in appendix C of [1]

In eq. (C.5) a term is missing, due to an incorrect treatment of the boundary terms in the integration of the fully differential distribution. The missing term that must be added to the equation is:

$$\Delta\mathcal{C}_{\hat{\rho}_D^3}^{(SM)} = 2(1-\rho_\ell-\rho)\,(1+\rho-\rho_\ell)\rho_\ell\sqrt{\lambda}$$

Therefore, eq. (C.5) reads:

$$\begin{aligned}\mathcal{C}_{\rho_D^3}^{(SM)} = \frac{2}{3}\sqrt{\lambda}\Big[&17+\rho-11\rho^2+5\rho^3+\rho_\ell(4+18\rho-32\rho^2)\\ &+\rho_\ell^2(-23-35\rho)+2\rho_\ell^3+3\rho_\ell[(1-\rho_\ell)^2-\rho^2]\Big]\\ -8\Big\{&\rho_\ell^2(-1+5\rho^2+\rho_\ell)\mathcal{L}_1+[1-\rho_\ell+\rho_\ell^2(-1+5\rho^2+\rho_\ell)]\mathcal{L}_2\Big\}\end{aligned}$$

The correction in the $1/m_b^3$ term of the total rate has no impact on the numerical results presented in [1]. Indeed we find $\frac{\Delta\mathcal{C}_{\hat{\rho}_D^3}^{(SM)}}{\mathcal{C}_{\hat{\rho}_D^3}^{(SM)}} \sim \mathcal{O}(10^{-4})$ in the muon case, and $\mathcal{O}(10^{-2})$ in the $\tau$ case, well below the uncertainty affecting the hadronic parameter $\hat{\rho}_D^3$.



## References

[1] P. Colangelo, F. De Fazio and F. Loparco, *Inclusive semileptonic $\Lambda_b$ decays in the Standard Model and beyond*, *JHEP* **11** (2020) 032 [arXiv:2006.13759] [INSPIRE].

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