2nd year PhD report

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Reasearch activity

During the second year as a PhD student my research activity focused mainly on the physics analysis of the data collected by the LHCb experiment at LHC and, in parallel, on the feasibility study of a new and challenging photo-detector system for the so-called LHCb RICH phase-2 upgrade at the High-Luminosity LHC (HL-LHC).

The RICH (Ring Imaging Cherenkov)[1] detector at LHCb is essential in order to identify final state charged hadrons in a wide momentum range. Currently the whole LHCb experiment, including the RICH, is undergoing a major upgrade to improve its physics potential after the restart of LHC in 2021[2], but studies in different areas are also underway to see how LHCb can operate in the much harsher conditions foreseen for the beginning of the HL-LHC phase in 2030[3].

The topic of my analysis is the search for CP violation in the $B^0 \to p\bar{p}K^+\pi^-$ channel using triple product asymmetries[4]. Asymmetries in the triple products of final-state momenta are expected to be sensitive to new physics and the rich resonant structure in B^0 four-body decays may further enhance the sensitivity to CP violation.

Measurements of these type are also very interesting because they are almost systematic free since, in principle, reconstruction effects due to the detector do not affect the result.

I presented the progresses of my analysis on a regular basis at the LHCb Charmless Working Group (BnoC) meetings during the year. The analysis is currently in an advanced state and is about to enter the internal to the collaboration review process.

Moreover, in July 2019, I was appointed stripping liason of this working group. The stripping process is a data preselection step to reduce data size selecting only interesting candidates to a manageable level for final user data analysis.

The main role of the stripping liason is to collect new software selection lines developed by analysts for their own analysis and make sure that they perform correctly and fulfill the requirements imposed by the collaboration.

During this year I also worked on the characterization at low temperature of silicon photomultipliers (SiPM) to assess whether they can be used as photodetector for the RICH during the high luminosity phase at LHC. The aim of this measurement is to understand precisely how these devices behave at low temperatures in terms of nuisance parameters like dark count rates, cross talk, and how their internal gain depends on the applied voltage. All the measurements were done in our lab and the analysis of the data is still ongoing. I also started implementing a simulation of the behavior of the SiPM, which is tuned using the data taken in the lab, to better understand the impact of these nuisance parameters on the performance of the detector.

In July I became a cooperation associate (COAS) at CERN and will be based there full time for the period of one year ending July 2020. While at CERN I am helping in the commissioning processes of the phase-I LHCb RICH upgrade, which will be installed during the next year in order to be ready for the be-

ginning of Run3 in 2021. In particular I am involved, alongside other members of the LHCb RICH-Upgrade team, in the development of the detector control system (DCS).

Lectures attended

1. High energy astrophysics: F.Tavecchio (**exam given**)
2. Theoretical physics: G. Ridolfi (**exam given**)
3. Data analysis: F.Parodi, S.Passaggio (**exam given**)
4. Particle physics at hadronic colliders: C.Gemme, E.Robutti, H.Oide (**exam given**)
5. Particle physics: M.Pallavicini (**exam given**)
6. Particle detectors: M.Battaglieri, R.De Vita (**exam given**)

Conference Presentations

Talk given at Deep Inelastic Scattering (DIS) 2019, Torino(Italy) 8-12 April:
"Search for new physics in CP violation with beauty and charm decays at LHCb"

Talk given at Incontri di fisica delle alte energie (IFAE) 2019, Napoli(Italy) 8-10 April:
"Il rivelatore RICH dell' esperimento LHCb a LHC tra presente e futuro"

Procedings

1. Search for new physics in CP violation with beauty and charm decays at LHCb. https://pos.sissa.it/352/250/pdf

Publications

1. **"Search for the doubly charmed baryon Ξ_{cc}^{+}"**
   R. Aaij *et al.* [LHCb Collaboration].
   arXiv:1909.12273 [hep-ex]
   LHCb-PAPER-2019-029, CERN-EP-2019-199 http://inspirehep.net/record/1756849
2. **"Amplitude analysis of the $B^{+} \to \pi^{+}\pi^{+}\pi^{-}$ decay"**
   R. Aaij *et al.* [LHCb Collaboration].
   arXiv:1909.05212 [hep-ex]
   LHCb-PAPER-2019-017, CERN-EP-2019-157 http://inspirehep.net/record/1753654
   1 citations counted in INSPIRE as of 04 Oct 2019
3. **"Observation of several sources of CP violation in $B^{+} \to \pi^{+}\pi^{+}\pi^{-}$ decays"**
   R. Aaij *et al.* [LHCb Collaboration].
   arXiv:1909.05211 [hep-ex]
   LHCb-PAPER-2019-018, CERN-EP-2019-156 http://inspirehep.net/record/1753653
   1 citations counted in INSPIRE as of 04 Oct 2019
4. **"Measurement of the electron reconstruction efficiency at LHCb"**
   R. Aaij *et al.* [LHCb Collaboration].
   arXiv:1909.02957 [hep-ex]
   LHCb-DP-2019-003, CERN-EP-2019-181 http://inspirehep.net/record/1752988

5. **"Search for the lepton-flavour violating decays $B^+ \to K^+\mu^\pm e^\mp$"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1909.01010 [hep-ex]
CERN-EP-2019-172, LHCb-PAPER-2019-022 http://inspirehep.net/record/1752450
1 citations counted in INSPIRE as of 04 Oct 2019

6. **"Measurement of psi(2S) production cross-sections in proton-proton collisions at 7 and 13 TeV"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1908.03099 [hep-ex]
CERN-EP-2019-150, LHCb-PAPER-2018-049 http://inspirehep.net/record/1748712

7. **"Observation of new resonances in the $\Lambda_b^0\pi^+\pi^-$ system"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1907.13598 [hep-ex]
LHCb-PAPER-2019-025 CERN-EP-2019-153 http://inspirehep.net/record/1747307
3 citations counted in INSPIRE as of 04 Oct 2019

8. **"Measurement of CP violation in the $B_s^0 \to \phi\phi$ decay and search for the $B^0 \to \phi\phi$ decay"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1907.10003 [hep-ex]
LHCb-PAPER-2019-019, CERN-EP-2019-121 http://inspirehep.net/record/1745979
1 citations counted in INSPIRE as of 04 Oct 2019

9. **"Observation of the $\Lambda_b^0 \to \chi_{c1}(3872)pK^-$ decay"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1907.00954 [hep-ex]
DOI:10.1007/JHEP09(2019)028
JHEP **1909**, 028 (2019)
CERN-EP-2019-131, LHCb-PAPER-2019-023 http://inspirehep.net/record/1742215
2 citations counted in INSPIRE as of 04 Oct 2019

10. **"Search for new physics in CP violation with beauty and charm decays at LHCb"**
M. Bartolini [Lhcb Collaboration].
DOI:10.22323/1.352.0250
PoS DIS **2019**, 250 (2019). http://inspirehep.net/record/1756472

11. **"Measurement of CP observables in the process $\mathbf{B^0}$ $\mathbf{DK^{*0}}$ with two- and four-body D decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1906.08297 [hep-ex]
DOI:10.1007/JHEP08(2019)041
JHEP **1909**, 041 (2019)
LHCb-PAPER-2019-021, CERN-EP-2019-111 http://inspirehep.net/record/1740747

12. **"Updated measurement of time-dependent *CP*-violating observables in $B_s^0 \to J/\psi K^+K^-$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1906.08356 [hep-ex]
DOI:10.1140/epjc/s10052-019-7159-8
Eur. Phys. J. C **79**, no. 8, 706 (2019)
LHCb-PAPER-2019-013, CERN-EP-2019-108 http://inspirehep.net/record/1740746
4 citations counted in INSPIRE as of 04 Oct 2019

13. **"Precision measurement of the Λ_c^+, Ξ_c^+ and Ξ_c^0 baryon lifetimes"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1906.08350 [hep-ex]
DOI:10.1103/PhysRevD.100.032001

Phys. Rev. D **100**, no. 3, 032001 (2019)
LHCb-PAPER-2019-008, CERN-EP-2019-122 http://inspirehep.net/record/1740743
2 citations counted in INSPIRE as of 04 Oct 2019

14. **"Amplitude analysis of $B^{\pm} \to \pi^{\pm}K^{+}K^{-}$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1905.09244 [hep-ex]
LHCb-PAPER-2018-051, CERN-EP-2019-062 http://inspirehep.net/record/1736300
2 citations counted in INSPIRE as of 04 Oct 2019

15. **"Amplitude analysis of the $B^0_{(s)} \to K^{*0}\overline{K}^{*0}$ decays and measurement of the branching fraction of the $B^0 \to K^{*0}\overline{K}^{*0}$ decay"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1905.06662 [hep-ex]
DOI:10.1007/JHEP07(2019)032
JHEP **1907**, 032 (2019)
LHCb-PAPER-2019-004, CERN-EP-2019-063 http://inspirehep.net/record/1735301

16. **"Search for the lepton-flavour-violating decays $B^0_s \to \tau^{\pm}\mu^{\mp}$ and $B^0 \to \tau^{\pm}\mu^{\mp}$"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1905.06614 [hep-ex]
CERN-EP-2019-076, LHCb-PAPER-2019-016 http://inspirehep.net/record/1735300
5 citations counted in INSPIRE as of 04 Oct 2019

17. **"Measurement of CP-violating and mixing-induced observables in $B^0_s \to \phi\gamma$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1905.06284 [hep-ex]
DOI:10.1103/PhysRevLett.123.081802
Phys. Rev. Lett. **123**, no. 8, 081802 (2019)
LHCb-PAPER-2019-015, CERN-EP-2019-077, LHCb-PAPER-2019-015; CERN-EP-2019-077 http://inspirehep.net/record/1735188 2 citations counted in INSPIRE as of 04 Oct 2019

18. **"Performance of the Muon $g-2$ calorimeter and readout systems measured with test beam data"**
K. S. Khaw *et al.* [Muon g-2 Collaboration].
arXiv:1905.04407 [physics.ins-det]
DOI:10.1016/j.nima.2019.162558
Nucl. Instrum. Meth. A **945**, 162558 (2019)
FERMILAB-PUB-19-198-PPD http://inspirehep.net/record/1734415 1 citations counted in INSPIRE as of 04 Oct 2019

19. **"A search for $\Xi_{cc}^{++} \to D^{+}pK^{-}\pi^{+}$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1905.02421 [hep-ex]
LHCb-PAPER-2019-011, CERN-EP-2019-067 http://inspirehep.net/record/1733762
2 citations counted in INSPIRE as of 04 Oct 2019

20. **"Measurement of charged hadron production in Z-tagged jets in proton-proton collisions at $\sqrt{s} = 8$ TeV"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1904.08878 [hep-ex]
CERN-EP-2019-065, LHCb-PAPER-2019-012 http://inspirehep.net/record/1730448
5 citations counted in INSPIRE as of 04 Oct 2019

21. **"First Observation of the Radiative Decay $\Lambda_b^0 \to \Lambda\gamma$"**
R. Aaij *et al.* [LHCb Collaboration].

arXiv:1904.06697 [hep-ex]
DOI:10.1103/PhysRevLett.123.031801
Phys. Rev. Lett. **123**, no. 3, 031801 (2019)
CERN-EP-2019-060, LHCb-PAPER-2019-010 http://inspirehep.net/record/1729839
2 citations counted in INSPIRE as of 04 Oct 2019

22. **"Observation of a narrow pentaquark state, $P_c(4312)^+$, and of two-peak structure of the $P_c(4450)^+$"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1904.03947 [hep-ex]
DOI:10.1103/PhysRevLett.122.222001
Phys. Rev. Lett. **122**, no. 22, 222001 (2019)
LHCb-PAPER-2019-014 CERN-EP-2019-058 http://inspirehep.net/record/1728691
86 citations counted in INSPIRE as of 04 Oct 2019

23. **"Observation of an excited B_c^+ state"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1904.00081 [hep-ex]
DOI:10.1103/PhysRevLett.122.232001
Phys. Rev. Lett. **122**, no. 23, 232001 (2019)
CERN-EP-2019-050, LHCb-PAPER-2019-007 http://inspirehep.net/record/1727660
9 citations counted in INSPIRE as of 04 Oct 2019

24. **"Near-threshold $D\bar{D}$ spectroscopy and observation of a new charmonium state"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1903.12240 [hep-ex]
DOI:10.1007/JHEP07(2019)035
JHEP **1907**, 035 (2019)
CERN-EP-2019-047, LHCb-PAPER-2019-005 http://inspirehep.net/record/1727379
9 citations counted in INSPIRE as of 04 Oct 2019

25. **"Search for lepton-universality violation in $B^+ \to K^+\ell^+\ell^-$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1903.09252 [hep-ex]
DOI:10.1103/PhysRevLett.122.191801
Phys. Rev. Lett. **122**, no. 19, 191801 (2019)
LHCb-PAPER-2019-009, CERN-EP-2019-043, LHCb-PAPER-2019-009 CERN-EP-2019-043 http://inspirehep.net/record/1726420 81 citations counted in INSPIRE as of 04 Oct 2019

26. **"Observation of CP Violation in Charm Decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1903.08726 [hep-ex]
DOI:10.1103/PhysRevLett.122.211803
Phys. Rev. Lett. **122**, no. 21, 211803 (2019)
LHCb-PAPER-2019-006, CERN-EP-2019-042 http://inspirehep.net/record/1726338
32 citations counted in INSPIRE as of 04 Oct 2019

27. **"Measurements of CP asymmetries in charmless four-body Λ_b^0 and Ξ_b^0 decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1903.06792 [hep-ex]
DOI:10.1140/epjc/s10052-019-7218-1, 10.1140/S10052-019-7218-1
Eur. Phys. J. C **79**, no. 9, 745 (2019)
LHCb-PAPER-2018-044, CERN-EP-2019-13, LHCb-PAPER-2018-044 and CERN-EP-2019-13 http://inspirehep.net/record/1725467 1 citations counted in INSPIRE as of 04 Oct 2019

28. **"Measurement of the CP-violating phase ϕ_s from $B_s^0 \to J/\psi\pi^+\pi^-$ decays in 13 TeV pp collisions"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1903.05530 [hep-ex]
DOI:10.1016/j.physletb.2019.07.036
Phys. Lett. B **797**, 134789 (2019)
LHCb-PAPER-2019-003; CERN-EP-2019-037, CERN-EP-2019-037, LHCb-PAPER-2019-003 http://inspirehep.net/record/1724881 8 citations counted in INSPIRE as of 04 Oct 2019

29. **"Measurement of the mass difference between neutral charm-meson eigenstates"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1903.03074 [hep-ex]
DOI:10.1103/PhysRevLett.122.231802
Phys. Rev. Lett. **122**, no. 23, 231802 (2019)
CERN-EP-2019-032, LHCb-PAPER-2019-001 http://inspirehep.net/record/1724179 5 citations counted in INSPIRE as of 04 Oct 2019

30. **"Search for CP violation in $D_s^+ \to K_S^0\pi^+$, $D^+ \to K_S^0K^+$ and $D^+ \to \phi\pi^+$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1903.01150 [hep-ex]
DOI:10.1103/PhysRevLett.122.191803
Phys. Rev. Lett. **122**, no. 19, 191803 (2019)
LHCb-PAPER-2019-002, CERN-EP-2019-027 http://inspirehep.net/record/1723351 1 citations counted in INSPIRE as of 04 Oct 2019

31. **"Amplitude analysis of $B_s^0 \to K_S^0K^\pm\pi^\mp$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1902.07955 [hep-ex]
DOI:10.1007/JHEP06(2019)114
JHEP **1906**, 114 (2019)
LHCb-PAPER-2018-045, CERN-EP-2019-017 http://inspirehep.net/record/1721081 1 citations counted in INSPIRE as of 04 Oct 2019

32. **"Measurement of b hadron fractions in 13 TeV pp collisions"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1902.06794 [hep-ex]
DOI:10.1103/PhysRevD.100.031102
Phys. Rev. D **100**, no. 3, 031102 (2019)
CERN-EP-2019-016, LHCb-PAPER-2018-050 http://inspirehep.net/record/1720859 7 citations counted in INSPIRE as of 04 Oct 2019

33. **"Dalitz plot analysis of the $D^+ \to K^-K^+K^+$ decay"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1902.05884 [hep-ex]
DOI:10.1007/JHEP04(2019)063
JHEP **1904**, 063 (2019)
LHCb-PAPER-2018-039, CERN-EP-2018-336 http://inspirehep.net/record/1720423

34. **"Observation of $B_{(s)}^0 \to J/\psi p\overline{p}$ decays and precision measurements of the $B_{(s)}^0$ masses"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1902.05588 [hep-ex]
DOI:10.1103/PhysRevLett.122.191804
Phys. Rev. Lett. **122**, no. 19, 191804 (2019)
CERN-EP-2019-006, LHCb-PAPER-2018-046 http://inspirehep.net/record/1720479 1 citations counted in INSPIRE as of 04 Oct 2019

35. **"Measurement of B^+, B^0 and Λ_b^0 production in pPb collisions at $\sqrt{s_{\rm NN}} = 8.16\,\text{TeV}$"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1902.05599 [hep-ex]
DOI:10.1103/PhysRevD.99.052011
Phys. Rev. D **99**, no. 5, 052011 (2019)
LHCb-PAPER-2018-048; CERN-EP-2019-010, LHCb-PAPER-2018-048, CERN-EP-2019-010 http://inspirehep.net/record/1720413 9 citations counted in INSPIRE as of 04 Oct 2019

36. **"Measurement of the mass and production rate of Ξ_b^- baryons"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1901.07075 [hep-ex]
DOI:10.1103/PhysRevD.99.052006
Phys. Rev. D **99**, no. 5, 052006 (2019)
LHCb-PAPER-2018-047, CERN-EP-2018-348 http://inspirehep.net/record/1716259 4 citations counted in INSPIRE as of 04 Oct 2019

37. **"Observation of the doubly Cabibbo-suppressed decay $\Xi_c^+ \to p\phi$"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1901.06222 [hep-ex]
DOI:10.1007/JHEP04(2019)084
JHEP **1904**, 084 (2019)
LHCb-PAPER-2018-040, CERN-EP-2018-349 http://inspirehep.net/record/1714986 2 citations counted in INSPIRE as of 04 Oct 2019

38. **"Model-Independent Observation of Exotic Contributions to $B^0 \to J/\psi K^+\pi^-$ Decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1901.05745 [hep-ex]
DOI:10.1103/PhysRevLett.122.152002
Phys. Rev. Lett. **122**, no. 15, 152002 (2019)
LHCb-PAPER-2018-043, CERN-EP-2018-330 http://inspirehep.net/record/1714780 13 citations counted in INSPIRE as of 04 Oct 2019

39. **"Study of the $B^0 \to \rho(770)^0 K^*(892)^0$ decay with an amplitude analysis of $B^0 \to (\pi^+\pi^-)(K^+\pi^-)$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1812.07008 [hep-ex]
DOI:10.1007/JHEP05(2019)026
JHEP **1905**, 026 (2019)
LHCb-PAPER-2018-042, CERN-EP-2018-316 http://inspirehep.net/record/1709949 3 citations counted in INSPIRE as of 04 Oct 2019

40. **"Measurement of the branching fraction and CP asymmetry in $B^+ \to J/\psi\rho^+$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1812.07041 [hep-ex]
DOI:10.1140/epjc/s10052-019-6698-3
Eur. Phys. J. C **79**, no. 6, 537 (2019)
LHCb-PAPER-2018-036, CERN-EP-2018-298 http://inspirehep.net/record/1709948 2 citations counted in INSPIRE as of 04 Oct 2019

41. **"Search for the rare decay $B^+ \to \mu^+\mu^-\mu^+\nu_\mu$"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1812.06004 [hep-ex]
DOI:10.1140/epjc/s10052-019-7112-x
Eur. Phys. J. C **79**, no. 8, 675 (2019)

CERN-EP-2018-293, LHCb-PAPER-2018-037 http://inspirehep.net/record/1709439 1 citations counted in INSPIRE as of 04 Oct 2019

42. **"Search for CP violation through an amplitude analysis of $D^0 \to K^+K^-\pi^+\pi^-$ decays"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1811.08304 [hep-ex]
DOI:10.1007/JHEP02(2019)126
JHEP **1902**, 126 (2019)
LHCb-PAPER-2018-041, CERN-EP-2018-299 http://inspirehep.net/record/1704426 1 citations counted in INSPIRE as of 04 Oct 2019

43. **"Study of Υ production in pPb collisions at $\sqrt{s_{NN}} = 8.16$ TeV"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1810.07655 [hep-ex]
DOI:10.1007/JHEP11(2018)194
JHEP **1811**, 194 (2018)
LHCb-PAPER-2018-035, CERN-EP-2018-267 http://inspirehep.net/record/1699106 11 citations counted in INSPIRE as of 04 Oct 2019

44. **"Measurement of the Charm-Mixing Parameter y_{CP}"**
R. Aaij *et al.* [LHCb Collaboration].
arXiv:1810.06874 [hep-ex]
DOI:10.1103/PhysRevLett.122.011802
Phys. Rev. Lett. **122**, no. 1, 011802 (2019)
CERN-EP-2018-270 and LHCb-PAPER-2018-038, LHCb-PAPER-2018-038, CERN-EP-2018-270 http://inspirehep.net/record/1698962 4 citations counted in INSPIRE as of 04 Oct 2019

45. **"The Fermilab Muon g-2 experiment: laser calibration system"**
M. Karuza *et al.* [Muon G-2 Collaboration].
DOI:10.1088/1748-0221/12/08/C08019
JINST **12**, no. 08, C08019 (2017).
FERMILAB-CONF-17-554-E-PPD http://inspirehep.net/record/1617696 2 citations counted in INSPIRE as of 04 Oct 2019

46. **"Geant4 simulations of the lead fluoride calorimeter"**
A. A. Savchenko *et al.*.
arXiv:1611.10272 [physics.acc-ph]
DOI:10.1016/j.nimb.2017.03.084
Nucl. Instrum. Meth. B **402**, 256 (2017) http://inspirehep.net/record/1501045 1 citations counted in INSPIRE as of 04 Oct 2019

47. **"Electron beam test of key elements of the laser-based calibration system for the muon $g-2$ experiment"**
A. Anastasi *et al.*.
arXiv:1610.03210 [physics.ins-det]
DOI:10.1016/j.nima.2016.10.047
Nucl. Instrum. Meth. A **842**, 86 (2017)
FERMILAB-PUB-16-441-E-PPD http://inspirehep.net/record/1491208 17 citations counted in INSPIRE as of 04 Oct 2019

References

[1] RICH detectors,
`https://lhcb-public.web.cern.ch/lhcb-public/en/Detector/RICH2-en.html`

[2] Lars Eklund,
The LHCb Upgrade. https://arxiv.org/pdf/1709.04709.pdf

[3] I. Bediaga,
Physics case for an LHCb Upgrade II - Opportunities in flavour physics, and beyond, in the HL-LHC era. https://arxiv.org/pdf/1808.08865.pdf

[4] A.J. Bevan,
C, P and CP asymmetry observables based on triple product asymmetries. https://arxiv.org/pdf/1408.3813.pdf