

Table of Contents

HL/HE-LHC Physics Workshop -- WG 4: Flavour.....	1
Sign up to the WG mailing list.....	1
Working group meetings:.....	1
WG conveners:.....	1
Draft Table of Contents of report:.....	1

HL/ HE- LHC Physics Workshop -- WG 4: Flavour

Sign up [to the WG mailing list](#)

Working group meetings:

- [Indico](#)
- Next WG meeting: tba

WG conveners:

Jorge Martín Camalich and Jure Zupan (TH), Alex Cerri (ATLAS), Sandra Malvezzi (CMS), Vladimir Gligorov (LHCb)

Send mail to WG conveners

Draft Table of Contents of report:

This is a preliminary table of contents with approximate page limits.
Total pages so far: 110 pages.

1. **Vision** (5 pages)
2. **CKM Metrology and HL/ HE questions for B physics** (25 pages)
 - a. Tree-level determinations of CKM elements
 - i. V_{ub}
 - ii. V_{cb}
 - iii. B_{tag}
 - iv. Γ_{tag}
 - v. ...
 - b. $F=2$ processes and unitarity triangle
 - c. Future of inputs from charm and K - K_{bar} mixing
 - d. Experimental prospects (including interplay with **Belle II**)
 - i. V_{ub} and V_{cb} from semileptonic
 - ii. Time-integrated tree-level measurements of Γ_{tag} (including prospects with neutral and high-multiplicity modes)
 - iii. Time-integrated loop-level measurements of Γ_{tag}
 - iv. Time-dependent measurements of Γ_{tag}
 - v. Γ_{tag} combination and impact of external inputs
 - vi. Loop level measurements of Γ_{tag} and comparison with tree-level
 - vii. Determination of dms , dmd , and interplay with b-hadron lifetimes
 - viii. Semileptonic asymmetries and prospects for dgd
 - ix. Measurements of ϕ_{d} and ϕ_{s} , including prospects for LHC-only ϕ_{s} combination, and prospects for $B_{\text{s}} \rightarrow \text{phiph}$ for **CMS / ATLAS** in HL-LHC
 - x. Measurements of α
 - e. Combined th/exp perspective on future of global CKM fits
3. **HL/ HE questions for charm** (15 pages)

- a. Charm mixing
- b. Direct CP violating probes
- c. Null tests from isospin sum rules
- d. Radiative and leptonic charm decays
- e. Inputs for B physics
- f. Experimental prospects (including interplay with **Belle II** and **BES III**)
 - i. Neutral D meson mixing
 - ii. Time-dependent CP violation
 - iii. Direct CP violation
 - iv. Rare and radiative charm decays
 - v. Semileptonic charm measurements
- g. Combined th/exp perspective on charm mixing/CPV global fits and charm as input to B physics
4. **HL/HE questions for strangeness** (5 pages)
 - a. $K^0 \rightarrow \mu\mu$ Golden mode
 - b. $K_S \rightarrow \mu\mu$
 - c. $K_S \rightarrow ee$
 - d. $K_S \rightarrow \mu\mu\mu$
 - e. Questions for hyperons
 - f. Experimental prospects (including interplay with **NA62** ??)
5. **HL/HE questions for taus** (5 pages)
 - a. Tests of leptonic universality
 - b. LFV in tau decays ($\tau \rightarrow \mu\mu$) !!
 - c. Tests of QCD
 - d. V_{us} determination
 - e. Experimental prospects
6. **Spectroscopy** (10 pages)
 - a. Open questions in spectroscopy
 - b. Experimental probes in B decay
 - c. Probes from prompt production in pp
 - d. Experimental prospects (including interplay with **Belle II**)
 - i. Taxonomy of tetraquarks
 - ii. Taxonomy of pentaquarks
 - iii. Searches for further tetra- and pentaquarks
 - iv. Exotic spectroscopy with Bc decays
 - v. Study of doubly-heavy baryon
 - vi. Precision measurements of quarkonia
 - e. Combined th/exp perspective, including how far **ATLAS** / **CMS** can contribute to finding new states, confirming the pentaquark etc. observations, and studying their properties
7. **Implications of flavor anomalies and future sensitivities** (15 pages) !!
 - a. Theoretical prospects on FCNC $b \rightarrow sll$ and $b \rightarrow dll$ decays
 - b. Theoretical prospects tree-level $b \rightarrow c \tau \nu$ and $b \rightarrow u \tau \nu$
 - c. Experimental perspective (including interplay with **Belle II**)
 - i. Measurements of $B_q \rightarrow ll$ from **LHCb** / **ATLAS** / **CMS**
 - ii. Measurements of $b \rightarrow sll$ from **LHCb** / **ATLAS** / **CMS**
 - iii. Measurements of $b \rightarrow dll$
 - iv. Measurements of $b \rightarrow s\gamma$
 - v. Measurements of $b \rightarrow cl\nu$ including Bc and b-baryon prospects
 - d. Combined th/exp perspective on global interpretations (EFT/non-EFT), with particular emphasis on impact of **LHC** -only

- combined analysis and complementarity of this with **Belle II**
8. **Flavor aspects of top physics** in collaboration with **WG1** (10 pages)
 - a. Determinations of the V_{tx} CKM matrix elements
 - b. Determination of anomalous Wb vertices including CP-violation effects from T-odd kinematic distributions
 - c. Interpretation of limits in top FCNCs
 - d. SMEFT analysis and complementarity with B-decays
 - e. Experimental perspectives
 9. **Flavor aspects of Higgs** in collaboration with **WG2** (10 pages)
 - a. Yukawa modifications in flavor models
 - b. Exclusive Higgs decays
 - c. Flavor tagging (charm and strange), *exp mostly*
 - d. LFV decays of the Higgs, *exp mostly*
 - e. Yukawa constraints from Higgs distributions
 - f. CP violation in Higgs couplings (τ , $t\bar{t}H$), *exp mostly*
 - g. Experimental perspective
 10. **high pT searches in the context of the flavor anomalies** in collaboration with **WG3** (10 pages)
 - a. SMEFT analysis of the anomalies
 - b. Constraints on simplified models for $b \rightarrow c \tau \nu$
 - c. Constraints on simplified models for $b \rightarrow s \ell\ell$
 - d. Constraints on combined models
 11. **Summary of theory + experimental outlook with focus on a global analysis of the scale of NP whether the anomalies turn out to be real or not**

-- Michelangelo Mangano - 2017-11-02

This topic: LHCPhysics > HLHEWG4

Topic revision: r4 - 2018-02-20 - Michelangelo Mangano



Copyright © 2008-2019 by the contributing authors. All material on this collaboration platform is the property of the contributing authors.

Ideas, requests, problems regarding TWiki? Send feedback