

Flavour physics

Slides to guide the discussion

- Bullet points from the circulated document
- Feedback and comments received

Introduction

- Slides contain the flavour bullet points in the circulated document
 - Plus feedback received on the document (mostly from LHCb-UK)
- Statements are there to guide and trigger the discussion
 - Fully expect them to be modified, replaced, or scrapped
 - We will take note of comments made
 - The modified statements will form the basis of a more detailed text

Flavour physics bullet #1

- Complimentary to energy frontier collider physics. Provides an indirect probe higher mass scales. Should be pursued.
 - May provide insights and guidance for decision on future energy and intensity frontier machines.
- Feedback:
 - Statement far too weak: Flavour physics **must** be pursued
 - Agree that flavour physics may provide insight on the energy scale of BSM physics. Caution: this argument should not be used to for a 'wait and see' approach to decision making

Flavour physics bullet #2

- Large UK involvement in LHCb and its upgrades. Support for LHCb upgrade(s) to exploit the full flavour potential of LHC.
- Feedback:
 - Emphasise that LHCb phase II upgrade is essential flavour potential of HL-LHC

Flavour physics bullet #3

- UK involvement in NA62, should we make a statement?
 - Support an extension of the operation and data taking of NA62 to reduce the statistical uncertainty to X% in its flagship measurement.
 - Support an upgrade of Kaon physics programme at CERN?

Flavour physics bullet #4

- UK involvement in SHiP, should we make a statement about SHiP?
 - Support continued R&D towards a general-purpose beam dump facility at CERN?
 - Support of the construction of the SHiP experiment?
- Feedback:
 - Primary physics goals of SHiP are not in the area of Flavour Physics. Larger overlap with goals of ATLAS & CMS
 - Avoid using flavour physics as a 'catch-all' term

Flavour physics bullet #5

- Lepton flavour experiments potential for interesting measurements. UK involved in several. UK will continue with involvement in current and future LFV experiments.

Flavour physics bullet #6

- UK involvement in $g-2$. Should we make a statement about support for MuonE?

Flavour physics bullet #7

- Limited UK involvement in hadron eEDM measurements at CERN
 - Do we want to make a statement about these?

Flavour physics bullet #8

- Other activities that would support a rich flavour physics programme?
- Feedback
 - Important to stress contributions from smaller experiments for a diverse programme
 - Low cost, diverse training opportunity, ensures good health of the field
 - State explicitly that the HL-LHC programme includes flavour physics (when listing topics that it involves)
 - Statement about ensure that the HL-LHC is compatible with LHCb Phase-II upgrade

Flavour physics bullet #8

- Other activities that would support a rich flavour physics programme?
- Feedback
 - Include a statement on supporting flavour physics on longer time scales, beyond HL-LHC
 - A broad flavour physics programme broadens and enhances the capabilities of future facilities. Hence this aspect should be considered in the decision process.