

Table of Contents

LHCb-Theory workshop: CP violation in B decays subgroup.....	1
Provisional agenda for CP violation in B decays session.....	1
Points for discussion.....	1
Documentation.....	2

LHCb-Theory workshop: CP violation in B decays subgroup

This Wiki page documents the discussions of the CP violation in B decays session of the LHCb-Theory November 2011 workshop. A proposed draft agenda is given below.

Provisional agenda for CP violation in B decays session

Everything below is provisional and subject to change.

- General LHCb results overview and prospects
 - ◆ Subject: give the full picture of LHCb coverage of CP violation in B sector (probes of NP in Bs mixing and in decays); also present some recent results (B2hh, Bs2phiphi, b-baryons, gamma measurements etc; leave Bs2jpsiphi to next talk)
 - ◆ Time: 20 mins
- ϕ_s measurements at LHCb
 - ◆ Subject: Status of ϕ_s measurement in Bs2JpsiPhi, Bs2Jpsif0 and future sensitivity (something about ambiguity removal? something about Bs2JpsiKst, Asl)
 - ◆ Time: 15 mins
- Impacts of recent LHCb results on NP models
 - ◆ Subject: How recent results constrain existing models. Which models survive and give predictions which LHCb can easily test in 2012? What are the cleanest (theoretically) observables that we could focus on.
 - ◆ Presenter: Gino Isidori
 - ◆ Time: 35 mins
- Specific theory talk on penguin pollution in ϕ_s
 - ◆ Subject: Controlling penguin uncertainty on ϕ_s .
 - ◆ Presenter: Robert Fleischer
 - ◆ Time: 35 mins
- What we can learn from b->s penguins?
 - ◆ Subject: how to best exploit channels like Bs->phiphi, ϕK^* and Bs->K*K*bar, what size of NP effects can we expect in observables like ϕ_s (phiphi), triple product asymmetries?
 - ◆ Presenter: Sebastian Jaeger
 - ◆ Time: 35 mins
- TIME FOR DISCUSSION (30-60 mins)

Points for discussion

- general question: can you give some example (popular) new physics models in each new physics scenarios (susy, extra dimension, technicolor, etc.) that are favoured by current flavour and LHC results? how useful is the ϕ_s measurement in building/assessing/discriminating new physics models?
- What is the impact of a SM compatible value of ϕ_s and its relation with the a_{sl} measurement from D0? Which models are favoured?
- Size of penguin pollution to ϕ_s . These are meant to be small, but how under control are the SM calculations?

- specifically, do the penguin contributions in $B_s \rightarrow J\psi\phi$ affect different polarization in the same way? can we exploit the difference in CP asymmetries between polarizations to say something about penguin contributions effect on ϕ_s ? for example, by measuring triple product asymmetries?
- is there any correlation between new physics in B_s mixing and new physics in $b \rightarrow s$ penguin?
- how sensitive are the triple product asymmetries in $B_s \rightarrow \phi\phi$ and $B^0 \rightarrow \phi K^*$ sensitive to new physics, which requires weak phase difference between different polarizations? what size of NP effect can we expect in the popular models?
- Investigating other CP asymmetries in the B system, in particular $b \rightarrow s$ penguins like $B \rightarrow \phi KS$ and $B \rightarrow \eta' KS$. Obviously trying to do things with η, η' have specific experimental issues which we would need to discuss.
- Impact of mixing-induced CP asymmetry of $B_s \rightarrow KK$ and B_s^0 lifetime on possible CP-violating NP in B^0_s - B^0_s mixing

Documentation

- We have composed a few slides (see attachments) which describe LHCb's short term planning for CPV measurements in the B sector. We state some unanswered questions which we would like to discuss with the theory community.

-- GreigCowan - 07-Oct-2011

This topic: LHCb > BeautyCPViolation

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