

# December Workshop

## Questions:

- What have we learned from the summer conference results?
- Are there any channels that are no longer interesting to focus on?
- Are there any channels that are more important now, than before?
- What changes are there to the interplay problem in terms of elucidating new physics?
- What are the highest priority areas to get analysts working on?
- What computing resources are required to perform such an analysis?
- What tools are require to perform such an analysis (are they available)?

# WG: New Physics in Mixing and CP Violation

Delta m and Delta Gamma precisions to be updated for December.

This is related to the physics observable uncertainties that are relevant for TDCPV in B decays.

## Convener's meeting: Rare decays

- Summer results:
  - No sign of SUSY yet: relevant for some radiative penguin searches, but too early to draw any conclusions
  - LHCb has measurement of  $A_{fb}$  in  $B \rightarrow K^* l l$ , comparable to results from Babar/Belle
  - No change in priority of different modes: top priority channels remain:  $B \rightarrow \tau \nu$ ,  $B \rightarrow K^*(*) \nu \nu$ ,  $b \rightarrow s l l$ ,  $b \rightarrow s g$ ,  $b \rightarrow d g$
  - It's desirable to have good fastsim studies on all of these in the near future ( $\sim 1$  yr)
  - The current MC request is around 75 billion events: 55 billion are generic and the rest is essentially BRECOIL-related. Additional events for  $b \rightarrow s g$  (not yet requested) will be necessary, but the amount will be quite small.
- Tools:
  - PID selectors
  - Hadronic and SL tagging: these are used in most analyses --> need documentation for new users (code cleanup?)
  - MC production: possibility to "re-use" hadronic or SL tag events with many different signal modes. This has been mentioned as a possibility, would be very useful for us.

# WG: Lepton Flavor Violation and New Physics Models

Nothing really changed, LFV is model dependent.

We need to make the case that this area is model dependent, and no one knows what the best transition is to measure. The tau mass can be useful in enhancing effects from some models, and in order to understand fully any charged LFV one would have to measure the three sets of couplings:  $3 \rightarrow 1$ ,  $3 \rightarrow 2$ , and  $2 \rightarrow 1$ ; where SuperB does the first two.

# WG: Charm Mixing and CP Violation in D decays

- Need to search for CPV, before moving on to try and understand it.
  - Work is ongoing in this area
  - Can anticipate that LHCb will do better than us in  $K\pi$
  - But: LHCb has trouble triggering on  $K_S$ , so we will be competitive with  $K_S\pi\pi$
- $D \rightarrow \mu\mu$  will be done better at LHCb, but in order to understand any NP contributions to this one has to understand the LD contributions to the amplitude. This can be done by measuring  $D \rightarrow \gamma\gamma$ , which requires an  $e^+e^-$  environment.
- Also should look for invisible / invisible + gamma decays

# WG: Spectroscopy, Exotica and Other Physics

## Questions:

- What have we learned from the summer conference results?

"nothing has changed with summer confs. wrt what our WG is concerned with."

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# WG: $\Upsilon(5S)$ Physics

Feedback from Alexey: Currently the next talks are expected:

1. Alexander Lenz (confirmed)  
"plenary talk – title tbc"
2. Felipe Llanes Estrada (Madrid Uni, confirmed)
3. Alexey Nefediev (ITEP, confirmed)
4. Alexey Drutskoy (confirmed)  
"First results from MC simulation for Bsdecays"
5. CDF (tbc, I spoke with Diego Tonelli and he asked to send official invitation to speaker committee).
6. LHCb (tbs, I plan to ask Gaya about).

## **What we need:**

- help with CNEF accounts and adaptation to the system. I would appreciate any help in this area.
- If somebody can help with 5S simulation - it's great, but we can certainly do it ourselves in any case. Please introduce/form some software group working for MC. We can contact with the group and probably help to adjust code to 5S simulation.

# WG: Phenomenology dealing with various topics

MSSM: squark and gluino masses of  $\sim 1\text{TeV}$  are still valid, but could be excluded soon. Can repeat with a higher energy scale.

Other models: analysis should be performed by experiments from experiments making those results, or phenomenologists in that area.

Plan for December: contact model experts to ask them for contributions: LHT, 4<sup>th</sup> Generation, Large extra dimension, mass insertion in MSSM.



# WG: Theoretical uncertainties

Vittorio: Does not make much sense to have another lattice talk. Can revisit for next May.

Paolo may be available to come and talk about some specific decays. Inclusive decays

# Physics tools

Many opportunities to contribute:

- detector response simulation in FastSim (SVT, DCH, DIRC, EMC, IFR)
- PID selectors
- simulation of background
- physics analysis tools (tagging, vertexing, ...)
- development of 'skims' for physics studies
- documentation

for more information contact Matteo Rama

# Proposal for sessions

subjects we would like to see discussed: these are some suggestions, please add to them

## • Day 1

- Welcome: Aims/intro
- DESY sll workshop summary
- WG5 session
  - progress on  $\alpha_s$
- $b \rightarrow s\gamma$  session
  - Theory + Expt overview, esp  $A_{CP}$
- $B_{u,d,s}$  session(s)
  - $B_s \rightarrow gg$  &/or ASL Fast Sim progress
  - $b \rightarrow sll$  inclusive/exclusive FastSim progress

## • Day 2

- charm
  - TDCPV progress
- tau
  - CPV
- Lattice
  - 2011 Comparison with CDR predictions
- Planning Session
  - Discuss tools required, and what FastSim mode studies we need for TDR/Book
- TDR/Physics Impact Document/  
Elba planning session

***Currently have one room booked for both days: all plenary.***

***Probably want some parallel sessions on Monday Morning. How many?***

# Computing Requirements

- Technical
- Service