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# Session organisation

A preliminary agenda for the session is:

Talk	Description	Speaker
Introduction	(5 min) Brief introduction of the session	
Interplay between direct and indirect searches	(30 min ) Summary of interplay between direct and indirect search results, including results from global fits	
Constraints on Wilson coefficients from global fits	(20 min) Overview of the constraints on C7, C9, C10 coming from global fits of radiative Bd decays and $Bd \rightarrow K^* \mu \mu$ . What measurements can we include to improve sensitivity to NP.	
LHCb summary: Prospects for $Bd \rightarrow K^* \mu \mu$ , $Bd \rightarrow K^* \gamma$ and related channels	(20 min) Overview of LHCb prospects for Winter conferences and 2012	
Observables in $b \rightarrow s$ (d) $\mu \mu$ and $b \rightarrow s$ (d) $\gamma$ decays	(20 min) What new observables can we add? What do large Isospin asymmetries tell us about NP? CP violation in rare decays?	
Coffee and discussion	(30 min)	
LHCb summary: reach in rare decay searches	(20 min) Summary of LHCb's sensitivity in rare decay searches for Winter conferences and 2012	
Searches with non-LFV channels	(30 min) Prospects for $D0 \rightarrow \mu \mu$ , $Bs(d) \rightarrow \mu \mu$ (and $\tau \tau$ ). Correlations between rare decay searches and mixing in B and Charm	
LFV searches	(30 min) Review of LFV $\tau$ decays after MEG. What are the correlations between charged and photon modes? What are the correlations between LFV $\tau$ decays and searches for non-LFV B and D decays.	

List of questions:

- General topics for discussion are:
  - ◆ The interplay between the various Rare Decays measurements and measurements of CPV in the B and Charm system.
    - ◇ What does the excess in  $B \rightarrow \tau \nu$  tell us about BR  $B \rightarrow \mu \mu$  and other rare decays?
  - ◆ Measurements with  $\tau$  decays (this is an area that LHCb is not yet heavily pursuing).
- $Bs \rightarrow \mu \mu$ :
  - ◆ Given the current limits on  $Bs \rightarrow \mu \mu$ , what are the prospects on  $Bs \rightarrow \tau \tau$ ,  $D0 \rightarrow \mu \mu$ , and related channels in MFV and non-MFV models?
  - ◆ SM calculation of BR( $Bs \rightarrow \mu \mu$ ): Summarize SM calculation with the different approaches used. Is there a preferred calculation? Suggest a values and publication as SM reference.
- $b \rightarrow s l^+ l^-$ 
  - ◆ What are the prospects for measurements of  $Bd \rightarrow K^* \tau \tau$ ? Are new observables accessible with  $\tau$  reconstruction (helicity of the lepton)?
  - ◆ Assuming  $Bd \rightarrow K^* \mu \mu$  is SM like, what are the prospects with  $Bs \rightarrow \phi \mu \mu$  and  $\Lambda_b \rightarrow \lambda \mu \mu$ ? Can there be large deviations in  $b \rightarrow d \mu^+ \mu^-$  channels where SM is further suppressed?
  - ◆ Can you see large direct CP asymmetries in  $Bd \rightarrow K^* \mu \mu$ ? Are there constraints from non-rare decays that limit the size of the CP violation?
  - ◆ Is a large, Babar-like, Isospin asymmetry possible in any class of NP models (whilst remaining consistent with  $A_I(K^* \gamma)$ )?

- Radiative decays:
  - ◆ What are the constraints from  $b \rightarrow d \gamma$  decays? And what can learn from  $b \rightarrow d \gamma$ ? Do we gain by measuring these suppressed modes versus measurements of  $b \rightarrow s \gamma$ ?
- LFV
  - ◆ Given existing results on  $\mu \rightarrow e \gamma$  and  $\mu \rightarrow 3 e$ , what are the prospects for  $\tau \rightarrow 3 \mu$ ?
  - ◆ What are the most promising decays to search for lepton flavour violation that can be measured in LHCb (which could include final states with electrons, muons, taus or charged hadrons, e.g.  $B \rightarrow e \mu$ )?
  - ◆ What are the correlations with other non-lepton flavour violating observables (e.g.  $B_s \rightarrow \mu \mu$ )?
- $B \rightarrow 4\mu$ , other decays
  - ◆  $B \rightarrow 4\mu$  is experimentally rather background free. Can it be used to constrain NP (e.g., look for  $Z'$  w/o contradicting  $B_s$  mixing, look for new scalars ...)
  - ◆ Can be this (or other channel) be related to HyperCP Sigma  $\rightarrow p \mu \mu$  (H.Park et al. (HyperCP Coll.) PRL 94, 021801 (2005))

# April 16th - 18th Session organisation for Rare Decays

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**April 18th 09:00-10:45**

-- ThomasBlake - 10-Oct-2011

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