

Sharpening the Tau Physics case for SuperB

January 15, 2008

1 Preamble

- I want to consult at least with the other conveners regarding intermediate deadlines
- the following reflects mainly my view (there has been limited feedback yet)

2 Introduction

- summarize SuperB vs. other facilities physics reach on Snowmass point or for some plausible NP scenarios – A.Lusiani, M.Roney, P.Paradisi, G.Isidori
 - the above relies on theory expectations on SnowMass points and estimates of experimental sensitivity documented in the following
 - other facilities mean SuperKekB at 10ab-1, will double-check LHC[b] reach, which does not appear to be a competitor
 - section summarizing advantages coming from beam polarization
 - short statement about running at threshold

3 LFV in tau decays

3.1 NP predictions, Snowmass point predictions

- update CDR with SnowMass points predictions – G.Isidori and P.Paradisi
- $\tau \rightarrow \mu\gamma$ predictions for Snowmass points probably already available
- if possible, include $\tau \rightarrow 3\ell$ and $\tau \rightarrow \ell hh$ from M.Herrero et al., either for required SPs or for constrained MSSM – G.Isidori and P.Paradisi

3.2 Experimental reach

- list safe conservative upper limits estimates – A.Lusiani, M.Roney
- for $\tau \rightarrow \mu\gamma$, list considered improvements, with estimated and simulated improvements – A.Lusiani, M.Roney
 - improvements being considered for BaBar analysis – S.Banerjee, (G.Marchiori)
 - improvements from beam polarization
 - * technical implementation of simulation – S.Banerjee
 - * exp. reach using simulation – A.Lusiani, A.Oyanguren, A.Cervelli
 - determination of properties of LFV interaction from polarization using simulation – A.Lusiani, A.Oyanguren, A.Cervelli

4 Charged current universality

No update to CDR.

5 CPT tests

No update to CDR.

6 Tau couplings

6.1 CPV in tau decay

- SPs predictions for CPV in tau decay – P.Paradisi & G.Isidori
- Exp. reach on paper – A.Lusiani, M.Roney, P.Paradisi (or P.Bernabeu)
- Exp. reach with simulation, esp. to evaluate syst. effects
 - technical implementation of polarization simulation – S.Banerjee
 - estimate stat./syst. errors – A.Lusiani, A.Oyanguren, A.Cervelli

6.2 Tau EDM

- Tau EDM NP predictions – P.Paradisi & G.Isidori (P.Bernabeu, O.Vives)
- no SnowMass points predictions are required
- report exp. reach on paper from P.Bernabeu paper
- Exp. reach with simulation, esp. to evaluate syst. effects
 - technical implementation of polarization simulation S.Banerjee
 - estimate stat./syst. errors – A.Lusiani, A.Oyanguren, A.Cervelli

6.3 Tau $g - 2$

- Tau $g - 2$ predictions from muon discrepancy – P.Paradisi
- no SnowMass points predictions are required
- report exp. reach on paper from P.Bernabeu paper
- Exp. reach with simulation, especially to evaluate syst. effects
 - technical implementation of polarization simulation S.Banerjee
 - estimate stat./syst. errors – A.Lusiani, A.Oyanguren, A.Cervelli

References