

Titus Mombächer

Very Rare Decays

Me in a nutshell:

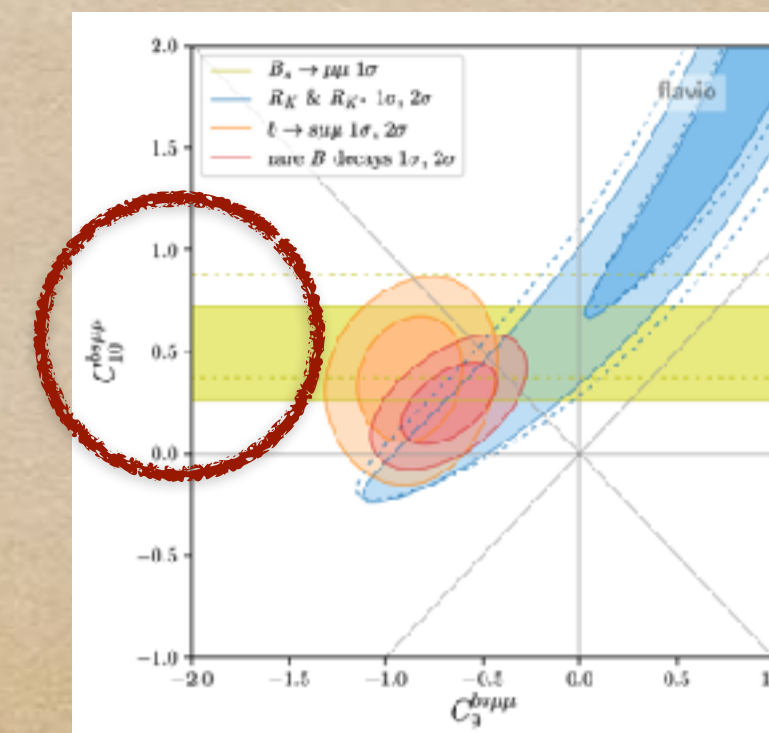
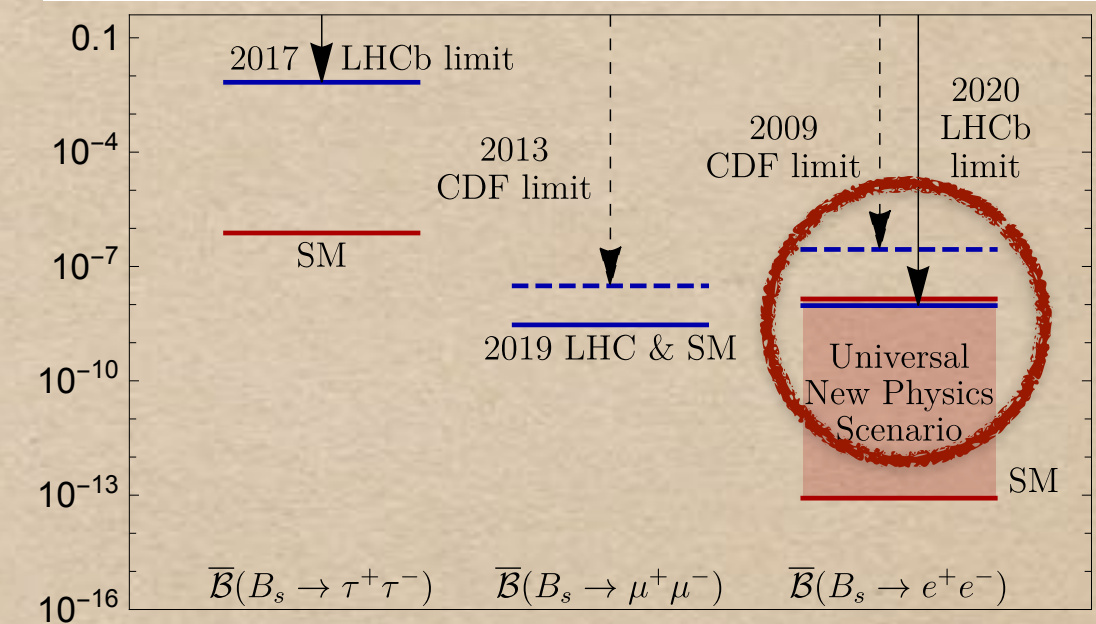
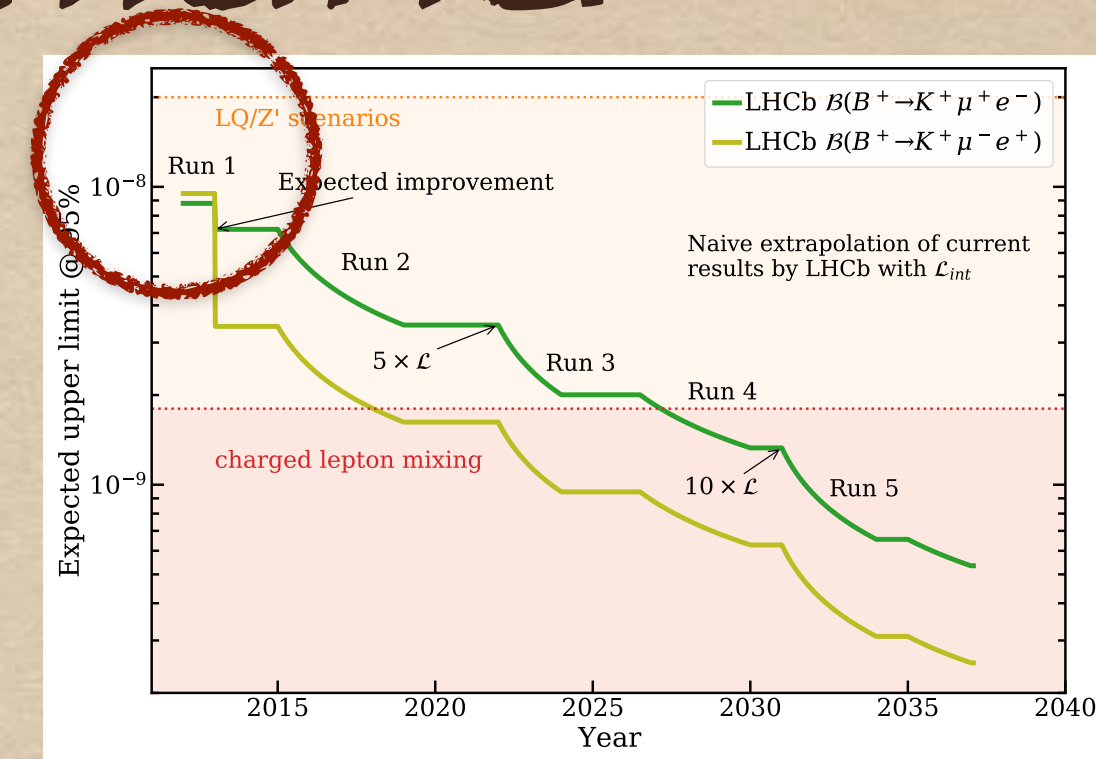
- I am a Christian
- I love music (play Cello)
- I like doing sports (football, volleyball,...)





My past in Dortmund

- ◆ Thesis defence: 25th November 2020
- ◆ Lepton Flavour Violation with $B^+ \rightarrow K^+ e^\pm \mu^\mp$
 - ◆ Motivation: neutrino oscillation (neutral lepton flavour violation!) and lepton universality violation
 - ◆ Imposed some stringent constraints on Z' and leptoquark models
- ◆ Search for $B_{(s)}^0 \rightarrow e^+ e^-$ and $B_{(s)}^0 \rightarrow \mu^+ \mu^-$ decays
 - ◆ Motivation: highly sensitive to scalar/pseudoscalar (NP) $b \rightarrow s \ell \ell$ currents, important in context with anomalies as in the SM only axial-vector currents exist
 - ◆ First time to probe NP space with $B_{(s)}^0 \rightarrow e^+ e^-$, most sensitive measurement in flagship analysis $B_{(s)}^0 \rightarrow \mu^+ \mu^-$





My present/future in Santiago

- ◆ VRD convener since January 2020
- ◆ Keep my foot on $B_{(s)}^0 \rightarrow \ell^+ \ell^-$
 - ◆ Start investigating CPV measurements in $B_s^0 \rightarrow \mu^+ \mu^-$ (Claire, I need your help on the Flavour Tagging)
 - ◆ Run 3+ will be a very different analysis environment
- ◆ Rare Kaon decays: $K_S^0 \rightarrow \pi^+ \pi^- e^+ e^-$, $K_S^0 \rightarrow 4\ell$
 - ◆ Sensitive to ALPs and other light mediators, esp. sensitive in Run 3+
- ◆ Rare multimuon decays: $B \rightarrow 6\ell + ?$
- ◆ Help Xabier with the Stealth physics
 - ◆ Support Adrián on $a \rightarrow \gamma\gamma$
 - ◆ Maybe redo (and extend) LLP search in $B^+ \rightarrow K^+ \chi(\ell^+ \ell'^-)$



Coming soon!