

CP violation in b- and c-hadron decays at LHCb

Testing the Standard Model of particle physics by precision measurements of CP violating observables in the decays of b and c hadrons has been one of the design goals of the LHCb experiment. The CKM angle γ is still the least known angle of the unitarity triangle, and the only one easily accessible using tree level decays. A recent combination of LHCb measurements in various $B \rightarrow DK$ decay modes has yielded the most precise determination of γ from a single experiment to date.

Measurements of time-dependent CP violation in the mixing of neutral B mesons and in the interference between mixing and decay are excellent probes to search for physics beyond the Standard Model. LHCb has performed world leading measurements of the semileptonic asymmetries, A_{sl} s and A_{sl}^d , and of the mixing-induced CP-violating phase ϕ_s in the $B_s^0 - \bar{B}_s^0$ system. Measurements of CP violating observables and other constraints from the decays $B_s^0 \rightarrow J/\psi K^*$, $B^+ \rightarrow J/\psi \pi^+$, $B_s^0 \rightarrow J/\psi K_S^0$ and $B^0 \rightarrow J/\psi \rho^0$ can be employed to put bounds on the possible pollution from Penguin topologies in measurements of ϕ_s and $\sin 2\beta$.

The LHCb experiment is collecting unprecedented samples of beauty baryons, allowing for the first time to study CP violating observables in their decays and to test the validity of the CKM mechanism in the baryon sector. First evidence for CP violation in the baryon sector has been observed using the decay mode $\Lambda_b^0 \rightarrow p \pi^- \pi^+ \pi^-$.

Finally, LHCb also has the largest samples of charmed hadron decays collected by any experiment to date. These samples yield some of the world's most sensitive searches for direct and indirect CP violation in charm decays.

I intend to submit my contribution for the proceedings

Yes

Primary author: STEINKAMP, Olaf (Universitaet Zuerich)

Presenter: STEINKAMP, Olaf (Universitaet Zuerich)