Contribution ID : **124** Type : **Plenary/section talk**

Measurement of the CKM phase ϕ_1 in $b \to c\overline{u}d$ transitions at Belle

Wednesday, 4 October 2017 09:15 (15)

Two recent results on the time-dependent CP violation in $b \to c\overline{u}d$ transitions are discussed. The first one is joint Belle and BaBar analysis of the $\overline{B}^0 \to D^0_{CP}h^0$ decays, where h^0 is a light unflavored meson and D^0 meson is reconstructed in a CP specific final state. The second one is analysis of the $\overline{B}^0 \to D^0h^0$, $D^0 \to K^0_S\pi^+\pi^-$ decays at Belle. Time-dependent analysis of the $b \to c\overline{u}d$ transitions provides the most precise measurement of the $\cos 2\varphi_1$, and it is almost free of the hadronic uncertainties. It also provides an approach for measurement of the $\sin 2\varphi_1$, complimentary to the $b \to c\bar{c}s$ analysis. Future analysis of the $b \to c\overline{u}d$ transitions with large data sets of LHCb and Belle II experiments will provide an essential test of the Standard Model.

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Session Classification : High Energy Physics - 2

Track Classification : High energy physics