



Contribution ID: 16

Type: contributed parallel talk

Towards determination of the weak and strong phases in neutral D-meson decays into $K^{*+}K^-$

Tuesday 18 July 2023 15:20 (20 minutes)

We study the effects of D^0 - \bar{D}^0 mixing and CP violation in $D^0 \rightarrow K^{*\pm}K^\mp$ decays and their CP-conjugated processes. We find that both the D^0 - \bar{D}^0 mixing parameters and the strong-interaction phase difference between $\bar{D}^0 \rightarrow K^{*\pm}K^\mp$ and $D^0 \rightarrow K^{*\pm}K^\mp$ transitions can be determined from the time-dependent measurements of these decay modes. In particular, it is possible to determine these physical quantities from the time-independent measurements of coherent $(D^0\bar{D}^0) \rightarrow (K^{*\pm}K^\mp)(K^{*\pm}K^\mp)$ decays on the $\psi(3770)$ and $\psi(4140)$ resonances at a super- τ -charm factory. Provided the CP-violating phase of D^0 - \bar{D}^0 mixing is significant in an underlying scenario beyond the standard model, it can also be extracted from the $K^{*\pm}K^\mp$ events.

Consent

I consent to recording/broadcasting my presentation.

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Session Classification: Parallel A

Track Classification: decays