

CDF MEASUREMENT OF CP VIOLATION IN $D^0 \rightarrow$ $H^+ H^-$ DECAYS

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Discrepancies between theory and measurements of lower-energy quantities may reveal virtual contributions of new particles prior to their direct observation.

Historically, this "indirect" approach has been rewarding, especially in the quark-flavor sector. The CDF experiment at the Tevatron proton-antiproton collider has access to the world's largest samples of charm and beauty hadrons, which provide information competitive and complementary to that from dedicated flavor facilities, and sensitive to physics beyond the standard model. This successful program has now reached its maturity and indeed challenges the standard model predictions.

I present the latest measurement of CP violating asymmetries in $D^0 \rightarrow \pi^+ \pi^-$ and $D^0 \rightarrow K^+ K^-$ decays. We use the strong $D^{*+} \rightarrow D^0 \pi^+$ decay to identify the flavor of the charmed meson at production time and exploit CP-conserving strong charm-anticharm pair-production. Higher statistic samples of $D^0 \rightarrow K^- \pi^+$ decays are used to highly suppress systematic uncertainties due to detector effects. The results, at the permille level, are the world's most precise ones from a single experiment to date.

Particle
Physics
Seminar

All interested
persons are
cordially
invited to
attend.