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Measurement of the Charge-Parity and Forward-Backward Asymmetries in the Decay

$$D^{\pm} \rightarrow \phi \pi^{\pm} \rightarrow K^{+} K^{-} \pi^{\pm} \text{ at CDF}$$

Monday, 13 June 2016 11:00 (15 minutes)

Charge-parity violation (CPV) is important to explaining the matter-antimatter asymmetry in the universe. CPV is predicted in the Standard Model through the complex nature of the quark mixing matrix. CPV has been measured in B meson decays through the interference of different decay paths to the same final state. In decays of D mesons CPV is predicted to be very small and is not yet observed. We measure the charge-parity and forward-backward asymmetries in the Cabibbo-suppressed decay $D \rightarrow \phi \pi \rightarrow K K \pi$ using the full CDF dataset. It is expected that CP asymmetries will be more visible in Cabibbo-suppressed decays. We compare the D measurements with the same measurement performed with $D_s \rightarrow \phi \pi \rightarrow K K \pi$ decays to cancel asymmetries from the detector. With approximately one million D decays and 1.5 million D_s decays we are sensitive to very small asymmetries. We expect to see significant improvement over previous measurements.

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