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## Measurement of the Charge-Parity and Forward-Backward Asymmetries in the Decay $D^\pm \rightarrow \phi \pi^\pm \rightarrow K^+ K^- \pi^\pm$ at CDF

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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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