Evidence for D^0-$\bar{D}^0$ Mixing Using the CDF II Detector NAGESH
KULKARNI, Wayne State University, CDF COLLABORATION — We measure
the time dependence of the ratio of decay rates for the rare decay $D^0 \rightarrow K^+\pi^-$
to the Cabibbo-favored decay $D^0 \rightarrow K^-\pi^+$. We use a signal of 12.7×10^3 $D^0 \rightarrow$
$K^+\pi^-$ decays with proper decay times between 0.75 and 10 mean D^0 lifetimes.
The data sample was recorded with the CDF II detector at the Fermilab Tevatron
and corresponds to an integrated luminosity of 1.5 fb^{-1} for $p\bar{p}$ collisions at $\sqrt{s} =$
1.96 TeV. We search for D^0-$\bar{D}^0$ mixing and measure the mixing parameters to be
$R_D = (3.04 \pm 0.55) \times 10^{-3}$, $y' = (8.5 \pm 7.6) \times 10^{-3}$, and $x'^2 = (-0.12 \pm 0.35) \times 10^{-3}$.
We report Bayesian probability contours in the x'^2-y' plane and find that the data
are inconsistent with the no-mixing hypothesis with a probability equivalent to 3.8
Gaussian standard deviations. Potential updates to the analysis will be presented.

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