5 modes decay of $D^0$ is done.

- cut (D*+ decay) $0.0 \text{ GeV} < Q < 0.02 \text{ GeV}$
- $D^*+ \rightarrow D^0 \pi^+$
- cut (D0 decay) $1.78 \text{ GeV} < M < 1.94 \text{ GeV}$
- $D^0 \rightarrow K^- \pi^+$
- $D^0 \rightarrow K^- \pi^+ \pi^0$
- $D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-$
- $D^0 \rightarrow K^- k^+$
- $D^0 \rightarrow K^0_s \pi^+ \pi^-$

For Data, Beam background is not taken into account.
The data are prod 5 data (release-02 − 00 − 01).

Analysis is done in release-02 − 01 − 00

Efficiency = \frac{\text{number of events passing PID cuts}}{\text{number of events no PID cuts}}

Fake rate of particle 1 = \frac{\text{number of events in which particle 1 fakes particle 2}}{\text{number of events with all particle 2}}
$M \{\text{abs}(d\text{stQ})<0.08\}$

![Graph showing $M(D_0)$ with MC and Data curves.](image-url)
- If sharp PID cut is done, efficiency is lost but purity is gained.
- If loose PID cut is done, efficiency is gained but purity is lost.
- Choose PID cut according to analysis we wanna do.
Reconstruct,

\[ D^{*0} \rightarrow D^0 \gamma \text{ or } D^{*0} \rightarrow D^0 \pi^0 \]

\[ X(3872) \rightarrow D^{*0} \bar{D}^0 \]

\[ B \rightarrow X(3872)K \]

This was previously done for 605 fb\(^{-1}\) datasample.