



Contribution ID: 488

Type: Parallel talk

Observation of the rare decay $D^0 \rightarrow K^- \pi^+ e^+ e^-$

Thursday 11 July 2019 15:45 (15 minutes)

Flavor-changing neutral current (FCNC) processes are rare within the Standard Model (SM) as they cannot occur at tree level and are suppressed at loop level by the Glashow-Iliopoulos-Maiani (GIM) mechanism. In D -meson decays, the GIM cancellation is almost exact, leading to expected branching fractions for $c \rightarrow ul^+l^-$ processes of order $\mathcal{O}(10^{-9})$. However, long-distance effects can raise this to $\mathcal{O}(10^{-6})$. In this talk, we report on the observation of the $D^0 \rightarrow K^- \pi^+ e^+ e^-$ decay, based on a sample of about 470 fb^{-1} of data collected at or near the $\Upsilon(4S)$ resonance, with the $BABAR$ detector at the PEP II e^+e^- collider.

We measure $\mathcal{B}(D^0 \rightarrow K^- \pi^+ e^- e^+) = (4.0 \pm 0.5) \times 10^{-6}$ in the di-lepton mass range $0.675 < m(e^+e^-) < 0.875 \text{ GeV}/c^2$, where the production of the intermediate state $\rho \rightarrow e^+e^-$ dominates, and set upper limits for decays outside this interval where long-distance effects are expected to be small. The result in the $\rho \rightarrow e^+e^-$ region is consistent with the recent observation of the analogous $D^0 \rightarrow K^- \pi^+ \mu^+ \mu^-$ decay, reported by the LHCb Collaboration.

Authors: ANULLI, Fabio (Sapienza Universita e INFN, Roma I (IT)); WILSON, Fergus (Science and Technology Facilities Council STFC (GB))

Presenter: WILSON, Fergus (Science and Technology Facilities Council STFC (GB))

Session Classification: Flavour Physics and CP Violation

Track Classification: Flavour Physics and CP Violation