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Test lepton flavor universality with (semi)leptonic D decays at BESIII

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Using 2.93 fb^{-1} data taken at $\sqrt{s}=3.773 \text{ GeV}$ and 3.19 fb^{-1} data taken at $\sqrt{s}=4.178 \text{ GeV}$ with the BESIII detector, precision measurements of the branching fractions of $D^0 \rightarrow K^- \mu^+ \nu_\mu$, $D^+ \rightarrow K^- 0 \mu^+ \nu_\mu$, $D^0 \rightarrow \pi^- \mu^+ \nu_\mu$, $D^+ \rightarrow \pi^0 \mu^+ \nu_\mu$ and $D^+ s \rightarrow \mu^+ \nu_\mu$ are performed.

Combining the known branching fractions of $D \rightarrow K^- e^+ \nu_e$, $D \rightarrow \pi^+ e^+ \nu_e$ and $D^+ s \rightarrow \tau^+ \nu_\tau$, we have tested the lepton flavor universality with $D \rightarrow K^- \ell^+ \nu_\ell$, $D \rightarrow \pi^+ \ell^+ \nu_\ell$ and $D^+ s \rightarrow \ell^+ \nu_\ell$ decays.

We have also tested lepton flavor universality in different q^2 intervals for $D \rightarrow K^- \ell^+ \nu_\ell$ ($\ell=e$ or μ).

Besides, hadronic form factor $f_{K^+(0)}$, $D^+ s$ decay constant $f_{D^+ s}$, and quark mixing matrix element $|V_{cs}|$ are also extracted with the most precise accuracies to date.

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