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Leptonic and semi-leptonic decays of charmed mesons at BESIII

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The BESIII experiment at BEPCII accumulated the world's largest e^+e^- collision samples at 3.773 and 4.178 GeV. We have studied the purely leptonic decays $D_{(s)}^+ \rightarrow l^+ \nu$, and the semi-leptonic decays of $D^0 \rightarrow K(\pi)^- e^+ \nu_e$, $K(\pi)^- \mu^+ \nu_\mu$, $D^+ \rightarrow \bar{K}^0(\pi^0) e^+ \nu_e$, $\bar{K}^0(\pi^0) \mu^+ \nu_\mu$ and $D_s^+ \rightarrow K^{(*)0} e^+ \nu_e$. We will report the improved measurements of the branching fractions of these decays and the CKM matrix elements $|V_{cs(d)}|$, the $D_{(s)}^+$ decay constants, the form factors of $D_{(s)}^+$ semi-leptonic decays. These results are important to calibrate the LQCD calculations of $D_{(s)}^+$ decay constants and form factors and to test the CKM unitarity.

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Author: COLLABORATION, BESIII

Presenter: COLLABORATION, BESIII

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