

Charm meson physics at BESIII

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BESIII Collaboration has accumulated the world's largest e^+e^- collision samples at $E_{cm} = 3.773, 4.009, 4.18$ GeV. From analyses of pure leptonic decay $D(s)^+ \rightarrow l^+\nu$ ($l = \mu$ or τ), semileptonic decays of $D \rightarrow K(\pi)l^+\nu$ ($l = e$ or μ), $D^+ \rightarrow K^-\pi^+e^+\nu$, $D^+ \rightarrow \omega e^+\nu$, $D^0(+) \rightarrow f_0(980)e^+\nu$, $D_s^+ \rightarrow \eta^{(\prime)}e^+\nu$, and D_s^+ to $\eta^{(\prime)}e^+\nu$, we report the determinations of their absolute branching fractions, CKM matrix elements $|V_{cs}(d)|$, the $D(s)^+$ decay constants, the form factors of D semi-leptonic decays. These are important to calibrate the LQCD calculations of decay constants and form factors and to test the CKM unitarity. We have performed an amplitude analysis of $D^0 \rightarrow K^-\pi^+\pi^+\pi^-$, and have measured the asymmetries of $D^+ \rightarrow K_S^0/LK^+(\pi^0)$ and $D^0 \rightarrow K_S^0/L\pi^0(\pi^0)$, as well as the branching fractions for $D^0(+) \rightarrow PP$ and some decays containing two KSs. In addition, we also measure the branching fractions for $D_s^+ \rightarrow \omega \pi^+$, ωK^+ and baryon decay of $p\pi$.

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