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Study of scalar and vector mesons in the charmed hadron decays

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Charmed hadron decays offer an excellent environment for studying non-perturbative QCD. In addition, these decays involving scalar and vector mesons as final state particles play a crucial role in investigating the nature of scalar mesons, like a_0 and f_0 , as well as examining the decay of vector mesons, like ϕ .

The BESIII experiment has collected 7.33 fb^{-1} and 20 fb^{-1} at 4.128-4.226 GeV and 3.773 GeV, respectively. In this talk, we will report our findings on the $\Lambda_c \rightarrow \Lambda a_0(980)$ decay in $\Lambda_c \rightarrow \Lambda \pi \eta$, as well as the measurements of the $D(s) \rightarrow SP, SV, VP$ decays, in the amplitude analyses of $D(s)$ three- and four-body decays. This includes the discovery of a new a_0 -like triplet and investigation of the W -annihilation-free decay $D \rightarrow K^* \eta$. In addition, we will report our recent measurement of branching fraction of ϕ decays in charmed meson decays, revealing a result significant deviated from the PDG value. Furthermore, we will present our studies of $D \rightarrow S$ semi-leptonic decays, $D(s) \rightarrow a_0(980)/f_0(980)/f_0(500)/\phi l \nu$, including the measurements of $D \rightarrow f_0(980)/f_0(500)/\phi$ transition form factors.

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