

Semileptonic and leptonic charm decays at BESIII

Thursday, 30 July 2020 11:07 (15 minutes)

BESIII has collected data samples corresponding to luminosities of 2.93 fb⁻¹ and 3.19 fb⁻¹ at center-of-mass energies of 3.773 and 4.178 GeV, respectively. In addition, data samples with a luminosity of about 3 fb⁻¹ at center-of-mass energies between 4.19 and 4.23 GeV are used to study D_s decays in some analyses. We report recent measurements that include the decays D(s)⁺ → l⁺ ν (l=μ, τ), D₀(⁺) → K⁺(π) l⁺ ν (l=e, μ), D₀(⁺) → a₀(980) e⁺ ν, D⁺ → K₁(1270) e⁺ ν, D(s) → η([′]) e⁺ ν, D_s → K(^{*})₀ e⁺ ν, and D_s → φ e⁺ ν. The first searches for D_s → γ e⁺ ν and D_s → p p̄ e⁺ ν are also presented. From these analyses, the decay constants f_{D(s)}, the semileptonic form factors f_{P⁺(0)} [P=K, π, η([′])], the CKM matrix elements |V_{cs}| and |V_{cd}| are determined precisely. These results can verify the LQCD calculations of f_{D(s)}, f_{P⁺(0)} and the CKM matrix unitarity. Precision tests of lepton-flavor universality are also made via D(s)⁺ → l⁺ ν and D₀(⁺) → K⁺(π) l⁺ ν, decays.

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Secondary track (number)

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Session Classification: Quark and Lepton Flavour Physics

Track Classification: 05. Quark and Lepton Flavour Physics