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V_{cs} **determination from** $D \to K\ell\nu$

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Semileptonic $D \to K\ell\nu$ decays provide one angle of attack to get at the CKM matrix element V_{cs}, complementary to the study of leptonic D_s decays. Here HPQCD present the results of an improved determination of V_{cs}, recently released on the arXiv (2104.09883).

We discuss a new, precise determination of $D \to K$ scalar and vector form factors from a lattice calculation on eight different $N_f = 2 + 1 + 1$ gluon field ensembles using the HISQ action, including three with physical light quark masses. When combined with experimental results, we are able to extract $|V_{cs}| = 0.9663(80)$ to a sub percent level of precision for the first time. This is achieved using three different methods, which each combine our form factors with different sets of experimental results in different ways, with the results in very good agreement. Our primary method is to use q^2 binned data for the differential decay rate, but we also calculate V_{cs} from the total branching fraction and from the value $|V_{cs}|f_+(0)$, which is also measured experimentally.

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