

## $V_{cs}$ determination from $D \rightarrow K\ell\nu$

### Content

Semileptonic  $D \rightarrow K\ell\nu$  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 we present the results of an improved determination of  $V_{cs}$ , recently released on the arXiv (2104.09883).

With a new, precise determination of  $D \rightarrow K$  scalar and vector form factors from lattice QCD, 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.

### Summary

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