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Model-independent fits to experimental and lattice data for $B \to D^* \ell \bar{\nu}$ (and other) exclusive decays

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We present an analysis of the exclusive semileptonic decay $B \to D^* \ell \bar{\nu}$ based on the Belle and Belle II data made public in 2023 and considering also a new combination of both data sets by HFLAV, combined with recent lattice-QCD calculations of the hadronic transition form factors by FNAL/MILC, HPQCD and JLQCD. The analysis is based on the form-factor parameterisation by Boyd-Grinstein-Lebed (BGL), determined both in terms of Bayesian and Frequentist statistics, for which we discuss novel strategies. We compare the results of an analysis where the BGL parameterisation is fit only to the lattice data with ones from a simultaneous fit to lattice and experiment, and discuss the resulting predictions for the CKM-matrix element $|V_{cb}|$ as well as other phenomenological observables, such as $R^{\tau/\mu}(D^*)$. We find tensions when comparing the analysis based on different experimental and/or theoretical input, requiring the introduction of a systematic error for our predictions.

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