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Charmed-Meson Decay Constants from Improved QCD Sum Rules

The decay constants of the heavy pseudoscalar mesons D and D_s are revisited within a recently developed novel approach to dispersive QCD sum rules relying on an unprejudiced implementation of quark–hadron duality. The proposed modifications of standard sum-rule techniques are assessed by applying our prescriptions to quantum mechanics, where exact solutions may be easily found by simply solving the Schrödinger equation. The striking similarity of the extraction procedures of bound-state parameters in potential models and in QCD gives us confidence in the reliability of our improvements and in their applicability to hadron phenomenology. The implications of the adopted definition of the heavy-quark masses are scrutinized and the MS-bar quark-mass scheme is identified as the optimal choice for our purposes. Our concepts prove to reconcile the sum-rule predictions for the charmed-meson decay constants with the findings of both lattice QCD and experiment.

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