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Impact of dynamical charm quarks

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We investigate the influence of dynamical charm quarks on various observables. For observables without explicit charm-quark dependence, decoupling applies and the effects are expected to be small. However, we also study quantities with explicit charm-quark dependence, like the charmonium mass spectrum, where decoupling does not apply.

Our study puts an emphasis on careful continuum extrapolations, which require very small lattice spacings when heavy quarks are present in the action. Since our precision goals cannot be currently met in full QCD, we carry our investigations out in a model without light quarks; quenched QCD is compared to QCD with two dynamical heavy quarks.

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