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Optimized meson operators for charmonium spectroscopy and mixing with glueballs

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Optimized meson operators in the distillation framework are used to study the charmonium spectrum in two ensembles with two heavy dynamical quarks at half the physical charm quark mass but different lattice spacings. The use of optimal meson distillation profiles is shown to increase the overlap with the ground state significantly, as well as grant access to excited states, for multiple quantum numbers including hybrid states with very little additional cost. These same operators are also employed for the calculation of meson-glueball mixing.

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