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The QCD vacuum wave functional and confinement in Coulomb gauge

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We report results on the Coulomb-gauge ghost propagator and the color-Coulomb potential computed in two lattice gauge-field ensembles: (1) configurations derived from our recently proposed Yang-Mills vacuum wave functional in 2+1 dimensions, and (2) lattices generated by Monte Carlo simulations of the three-dimensional Euclidean SU(2) lattice gauge theory with the Wilson action. We observe remarkable agreement between the ghost propagators in both ensembles, but some differences in the potentials. Those originate from rare configurations with very small values of the lowest eigenvalue of the Coulomb-gauge Faddeev-Popov operator. If the same cuts on such exceptional configurations are applied in both ensembles, then the color-Coulomb potentials are also in reasonably good agreement.

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