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Hybrid static potentials and glue lumps on $N_f = 3 + 1$ ensembles

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QCD permits the existence of hybrid mesons that are made up of both quarks and gluons, including exotic states, i.e., quantum numbers prohibited for pure quark-antiquark states, with possible candidates found in experiments. We present static hybrid potentials measured via Laplace trial states together with static-light meson thresholds on $N_f = 3 + 1$ dynamical fermion ensembles with 420 MeV pions. Furthermore, we measure corresponding gluelump masses which refer to the $R \rightarrow 0$ limit of the hybrid potentials and are essential input parameters for effective models to describe hybrid mesons.

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