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The $\Lambda(1405)$ at the $SU(3)$ point in lattice QCD

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The pole structure of the $\Lambda(1405)$ has been a topic of debate for a long time. Chiral perturbation theory predicts that its experimental spectrum may be explained by a two pole structure originating in the $SU(3)$ chiral dynamics of the baryon-meson interaction. The $SU(3)$ -symmetric flavor point is readily accessible in lattice QCD, in this work we study the baryon-meson states directly at this point. We construct interpolation operators that belong to the irreducible representations of $SU(3)$ that are attractive in the channel with the quantum numbers of the $\Lambda(1405)$ (singlet and two octets). The extracted energy levels can be used as input for chiral perturbation theory to find the poles associated with each representation. The relevant correlation functions are computed on $SU(3)$ -symmetric ensembles with $M_\pi \approx 714 MeV$ using the distillation technique.

Parallel Session (for talks only)

Hadronic and nuclear spectrum and interactions

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