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Pole trajectories of the \Lambda(1405) helps establish its dynamical nature

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Chiral trajectories of dynamically generated resonances are connected to the SU(3) breaking pattern and their nature. From an analysis of a recent LQCD simulation on the $\pi\Sigma - \bar{K}N$ scattering for $I = 0$, and the study of the quark mass dependence of the octet baryons, we determine for the first time the trajectory of the two poles associated to the $\Lambda(1405)$ towards the symmetric point ($\mathrm{Tr}[M] = \mathrm{cte}$) accurately. Our result at unphysical pion mass is consistent with the lattice simulation at $m_\pi \simeq 200$ MeV and the extrapolation to the physical point, based on the NLO chiral lagrangian, agrees perfectly well with previous analyses of experimental data. Contrary to other works, we predict qualitatively similar trajectories at LO and up to NLO, being consistent with the dominance of the LO interaction. At the SU(3) symmetric point up to NLO, we obtain that the lower pole is located at $E^{(1)} = 1595 \pm 8$ MeV, being a singlet representation, while the higher pole belongs to the octet with a mass $E^{(8)} = 1600 \pm 4$ MeV. This can be tested in the future LQCD simulations.

session

B. Hadron Spectroscopy

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