



Contribution ID: 80

Type: **Talk**

Evolution of the $\bar{K}N - \pi\Sigma$ system with M^2_π in a box from $U\chi$ PT

Thursday, 2 July 2015 17:30 (20 minutes)

The $\Lambda(1405)$ baryon is of continued interest in hadronic physics, being absent in many quark model calculations and supposedly manifesting itself in a two-pole structure. Finite-volume Lattice-QCD eigenvalues for different quark masses were recently reported by the Adelaide group [1]. We compare these eigenvalues to those of a unitary Chiral Perturbation Theory ($U\chi$ PT) model [2], evaluated in the finite volume [3]. The $U\chi$ PT calculation predicts the quark mass dependence remarkably well. It also explains the overlap pattern with different meson-baryon components, mainly $\pi\Sigma$ and $\bar{K}N$, at different quark masses. Some of the results of our calculation are shown in Fig. 1. We will study the properties of the two lower states in the box as predicted by $U\chi$ PT and compare to those of the two poles of the $\Lambda(1405)$ in the infinite limit. More accurate Lattice QCD are required to draw definite conclusions on the nature of the $\Lambda(1405)$.

References

- [1] J. M. M. Hall, W. Kamleh, D. B. Leinweber, B. J. Menadue, B. J. Owen, A. W. Thomas and R. D. Young, Phys. Rev. Lett. 114, no. 13, 132002 (2015)
- [2] E. Oset, A. Ramos and C. Bennhold, Phys. Lett. B 527, 99 (2002) [Phys. Lett. B 530, 260 (2002)]
- [3] M. Doring, J. Haidenbauer, U. G. Meissner and A. Rusetsky, Eur. Phys. J. A 47, 163 (2011)

Primary authors: Prof. DOERING, Michael (The George Washington University); MOLINA, Raquel (The George Washington University, Washington)

Presenter: MOLINA, Raquel (The George Washington University, Washington)

Session Classification: Parallel Session 6 - Hadron Structure & Meson-Baryon Interaction WG

Track Classification: Hadron Structure and Meson-Baryon Interaction Working Group