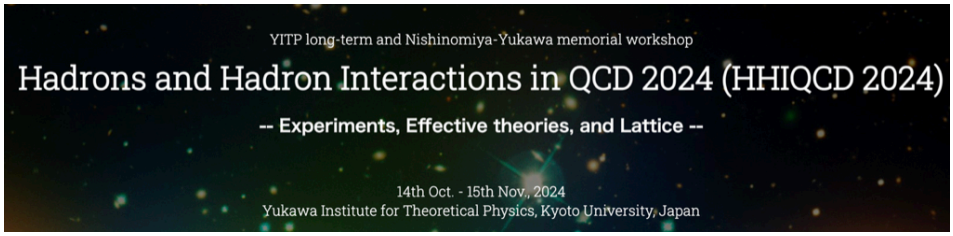

Contribution ID: **31** Type: **3rd week (Nishinomiya-Yukawa symposium)**

Lambda(1405) in the flavor SU(3) limit from lattice QCD

Monday, October 28, 2024 3:30 PM (1 hour)

We perform a numerical study in lattice QCD on $\Lambda(1405)$ in the flavor SU(3) limit. One of the most promising interpretations of $\Lambda(1405)$ is the so-called two-pole structure: the spectrum corresponding to $\Lambda(1405)$ observed in experiments may be explained by two poles. In order to elucidate such property from lattice QCD, the HAL QCD method is employed, in which hadron interactions are extracted as potentials. Employing configurations in the flavor SU(3) limit, we calculate meson-baryon potentials in the octet and singlet channels, in which the poles corresponding to Lambda(1405) are expected to appear. We find that local potentials both in octet and singlet channels have singular behaviors at the vanishing point of NBS wave functions, which prevent us from reliably extracting binding energies. In this talk, I present two analyses that avoid such singular behaviors: one is the analysis by taking a linear combination of the NBS wave functions in the octet channel under certain assumptions, and the other is by introducing separable potentials in the HAL QCD method instead of the standard local approximation usually employed. I also discuss the physical interpretations of our results, including the singular behaviors of the local potentials.

Primary authors: MURAKAMI, Kotaro (Tokyo Institute of Technology); Prof. AOKI, Sinya (Yukawa Institute for Theoretical Physics, Kyoto University)

Presenter: MURAKAMI, Kotaro (Tokyo Institute of Technology)

Session Classification: Nishinomiya-Yukawa workshop