

Studies on meson-baryon interactions in the HAL QCD method with all-to-all propagators

Tuesday, 4 August 2020 16:40 (20 minutes)

We investigate meson-baryon interactions in the HAL QCD method with all-to-all propagators using the stochastic estimations. We mainly report the analysis of the S-wave kaon-nucleon interactions at $m_\pi \approx 570$ MeV. Since there are no quark-antiquark creation/annihilation processes in this system, all-to-all propagators merely play a role in increasing statistics. In addition, we present the preliminary results for the P-wave pion-nucleon interaction in the $I = 3/2$ channel using the Δ source operator on a small volume at $m_\pi \approx 870$ MeV, which has a bound state corresponding to the $\Delta(1232)$ state.

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Session Classification: Hadron Spectroscopy and Interactions

Track Classification: Hadron Spectroscopy and Interactions