

Structure of hadron resonance with nearby CDD zero

Thursday 28 September 2017 17:50 (20 minutes)

We discuss the method to investigate the hadron compositeness from the analytic structure of the scattering amplitude.

Recently, there have been the discussions on the relation between the hadron structure and the position of the CDD (Castillejo-Dalitz-Dyson) zero, which is defined as the zero of an amplitude [1].

We consider a resonance in a coupled channel amplitude, in which a CDD zero exists near the resonance pole in one of the channels.

We show that, by taking the zero coupling limit, the resonance pole and the CDD zero merge and vanish at the position of the pole in the other channel.

Then we find that the compositeness of the state is small when the pole is accompanied by a nearby CDD zero.

As an application, the fraction of the $\bar{K}N$ ($\pi\Sigma$) component is small for the lower (higher) pole of the $\Lambda(1405)$ baryon [2].

[1] Y. Kamiya and T. Hyodo, Prog. Theor. Exp. Phys. (2017) 023D02.

[2] Y. Kamiya and T. Hyodo in preparation.

Authors: KAMIYA, Yuki; Prof. HYODO, Tetsuo (Yukawa Institute for Theoretical Physics, Kyoto University)

Presenter: KAMIYA, Yuki

Session Classification: Spectroscopy of baryons

Track Classification: Spectroscopy of baryons