

# Dynamical generation of axial-vector mesons

Thursday, 22 June 2023 17:50 (20 minutes)

We present recent results on the dynamical generation of the  $a_1$ ,  $h_1$ , and  $b_1$  axial-vector mesons. We demonstrate the emergence of the  $a_1$  and  $h_1$  mesons from the  $\pi\rho$  scattering process, based on the coupled-channel formalism with the  $\pi\rho$  and  $K\bar{K}^*$  ( $\bar{K}K^*$ ) channels. This is achieved by constructing kernel amplitudes using the effective Lagrangian and computing the coupled integral equation for  $\pi\rho$  scattering. By performing the partial-wave expansion, we explicitly show that the  $a_1(1260)$  meson arises as a  $K\bar{K}^*$  molecular state, generated only by including the  $K\bar{K}^*$  ( $\bar{K}K^*$ ) channel. The pole position of the  $a_1$  meson is determined to be at  $\sqrt{s_R} = (1170.7 - i173.0)$  MeV. We also investigate four different  $h_1$  mesons by coupling additional channels such as  $\eta\omega$  and  $\eta\phi$ , and find that  $h_1(1415)$  is strongly coupled to the  $K\bar{K}^*$  and  $\eta\phi$  channels, indicating its significant strange quark content. Additionally, we report a novel observation that the  $b_1$  meson has a two-pole structure that arises from  $\pi\omega$  scattering, with the interference of these two-pole resonances resulting in the appearance of  $b_1(1235)$ .

## Collaboration

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**Session Classification:** Parallel session B2