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Study the nature of $f_0(980)$ and $a_0(980)$

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In our work, we use the coupled channel approach to revisite the interaction of $K\bar{K}$ and its coupled channel, where the states $f_0(980)$ and $a_0(980)$ were dynamically reproduced in the interaction of isospin I=0 and I=1 sectors, respectively. In our results, the states of σ and $f_0(980)$ can be dynamically reproduced stably with varying cutoffs both in the coupled channel and the single channel cases. We find that the πη components is much important in the coupled channel interactions to dynamically reproduce the $a_0(980)$ state, which means that $a_0(980)$ state can not be a pure $K\bar{K}$ molecular state. Furthermore, we also calculated their radii, the compositeness, the wave functions and their productions in the final state interactions, aiming at looking inside their molecular nature.

Collaboration

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