



Iranian Journal of Physics Research, Vol. 18, No. 2, 2018

Investigation of the coupled $\bar{K}\bar{K}N - \pi\bar{K}\Sigma$ system using the Faddeev method

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(Received 03 March 2017 ; in final form 25 November 2017)

Abstract

Base on the non-relativistic Faddeev AGS method, three-body calculations of the coupled and quasi-bound $\bar{K}\bar{K}N - \pi\bar{K}\Sigma$ system are performed in the momentum space. Different phenomenological models of $\bar{K}N - \pi\Sigma$ potentials with one and two-pole structures of $\Lambda(1405)$ resonance are used to study the dependence of double-kaonic system binding energy on the coupled $\bar{K}N - \pi\Sigma$ interaction. Also, the effect of the $\bar{K}\bar{K}$ repulsive interaction is investigated in this system. The results of this work show that the binding energy of $\bar{K}\bar{K}N - \pi\bar{K}\Sigma$ quasi-bound state is $\sim 17 - 28 MeV$ and the width is about $\sim 61 - 110 MeV$.

Keywords: $\Lambda(1405)$, kaonic nuclei and $K^- K^- p$

For full article, refer to the Persian section