Abstract Submitted
for the HAW05 Meeting of
The American Physical Society

Systematic study of dense $\bar{K}$ nuclei with a revised $\bar{K}N$ potential AKINOBU DOTE, IPNS/KEK, YOSHINORI AKAISHI, Nihon University, TOSHIMITSU YAMAZAKI, RIKEN — Due to the strongly attractive $\bar{K}N$ interaction, a K^- meson can be deeply bound in nuclei. So far, we have investigated $\bar{K}$ nuclei with a phenomenological $\bar{K}N$ interaction. According to my study with the method of antisymmetrized molecular dynamics, we have found that a K^- meson can be bound by about 100 MeV below nucleus-K threshold in various light nuclei and makes nuclei drastically shrunk. $\bar{K}$ nuclei are very dense (over 4 times normal density) and have so interesting structures that we have never seen in usual nuclei. Recently, a few experimental groups have discovered $\bar{K}$ nuclei; $ppnK^-$ and $pnnK^-$ by Iwasaki *et al* and ppK^- by Nagae *et al*. According to these results, $\bar{K}$ nuclei are more deeply bound than our prediction. Taking them into account, $\bar{K}N$ potential should be somewhat enhanced than original one in case of my calculation. In addition, Nucleon-Nucleon LS interaction is found to give large contribution by the study of $pnnK^-$ which seems to have $(0s)^2(0p)$ nucleon configuration. Taking these points into consideration, we have confirmed that binding energies of various $\bar{K}$ nuclei increase to about 200 MeV measured from nucleus-K threshold. We expect that their structures should change more drastically. Moreover, we have interests in double $\bar{K}$ nuclei, which have two K^- mesons. They are expected to be so deeply bound. I will report on these issues. If possible, I'd like to mention other types of interaction and analysis from the viewpoint of quarks.

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Date submitted: 25 May 2005 Electronic form version 1.4