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## On the stability of $\Lambda(1405)$ -matter

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We report on our recent study of systems composed solely of  $\Lambda(1405)$  (denoted by  $\Lambda^*$ ) baryons [1] in which we test a hypothesis of absolutely stable strange hadronic matter [2]. We employed a broad range of  $\Lambda^*\Lambda^*$  interaction strengths compatible with binding energy of 2  $\Lambda^*$  system  $B(2\Lambda^*) = 40$  MeV given by the phenomenological energy-independent  $\bar{K}N$  interaction model by Yamazaki and Akaishi (YA) [3]. We performed calculations of  $\Lambda^*$  few-body systems within the Stochastic Variational Method (SVM) and many-body systems within the Relativistic Mean-Field (RMF) approach. We found that within the RMF calculations the binding energy per  $\Lambda^*$ ,  $B/A$ , saturates for  $A \geq 120$  with values of  $B/A$  considerably below 100 MeV, leaving  $\Lambda^*$  matter highly unstable against strong decay to  $\Lambda$  and  $\Sigma$  hyperon aggregates. The central density of  $\Lambda^*$  matter is found to saturate as well, at roughly twice nuclear matter density. Moreover, we demonstrate that the YA interaction model [3] fails to reproduce the  $K^-$  single-nucleon absorption fractions at rest from bubble chamber experiments [4,5,6].

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