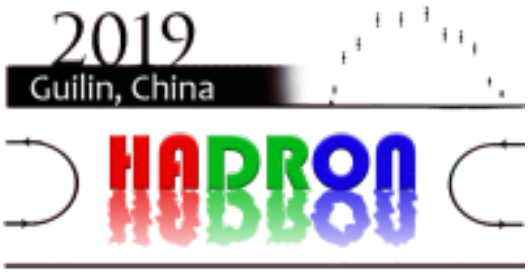

Contribution ID: **70** Type: **Parallel**

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

Sunday, 18 August 2019 17:20 (20 minutes)

We report on our recent study of systems composed solely of $\Lambda(1405)$ (denoted by Λ^*) 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 Λ^* 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 Λ^* 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 Λ^*, B/A, saturates for $A \geq 120$ with values of B/A considerably below 100 MeV, leaving Λ^* matter highly unstable against strong decay to Λ and Σ hyperon aggregates. The central density of Λ^* 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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Session Classification: Session 7: Hadrons in hot and nuclear environment including hypernuclei

Track Classification: Session 7: Hadrons in hot and nuclear environment including hypernuclei