$\bar{K}$ and multi-$\bar{K}$ nuclei and kaon condensation

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We report on recent relativistic mean-field calculations of $\bar{K}$ and multi-$\bar{K}$ nuclei [1,2,3] which were performed fully self-consistently across the period table. We discuss in detail dynamical processes and various thresholds that determine the $\bar{K}$ absorption width. The $\bar{K}$ separation energy B_K as well as the nuclear and $\bar{K}$-meson densities were found to saturate with the number of antikaons in the nuclear medium. Saturation appears robust against a wide range of variations, including the nuclear model used and the type of boson fields mediating the strong interactions. Since the $\bar{K}$ separation energy B_K does not exceed 200 MeV, multi-$\bar{K}$ nuclei lie energetically well above multi-hyperonic nuclei and it is unlikely that kaon condensation could occur in strong-interaction self-bound hadronic matter.

At present, we have been exploring properties of kaonic hypernuclei – strange systems made out of nucleons, hyperons and K^- mesons – finding out that saturation holds also in these objects. We will present preliminary results of these calculations.

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