Formation spectra of charmed meson-nucleus systems via $\bar{p}p$ reaction

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The study of hadron-nucleus systems is one of the ways to provide us with an information on the properties of hadron in nuclear medium. Pionic atoms and kaonic atoms have been intensively investigated over the years. Recently, the properties of heavy mesons are very interesting subjects because of improvements of experimental facilities. Especially we are interested in a charmed meson, D^- meson and D^0 meson.

In this contribution, I introduce calculated structures and formation spectra of D^--and D^0-nucleus systems. To obtain these systems, we use charmed meson-nucleus interactions calculated by an unitarized coupled-channel theory. The D^- mesic nuclei are of special interest, since they have tiny decay widths due to the absence of strong decays for the $\bar{D}N$ pair. We find some bound states by solving the Klein-Gordon equation for D^- and D^0 in finite nuclei. In addition, we calulated the formation spectra by the $(\bar{p}, D^+)$ reaction for D^--nucleus systems and the $(\bar{p}, \bar{D}^0)$ reaction for D^0-nucleus systems. Then, we discuss the possibility of the observation of charmed meson-nucleus systems, to give useful information to experiments with aniprotons beams, such as PANDA(FAIR) and J-PARC.