

Formation of η Mesic Nucleus

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Mesic atoms and mesic nuclei have been studied systematically for a long time and the observables of them, such as binding energy and absorption width, provided us unique and valuable information on the meson-nucleus interactions. In the contemporary hadron-nucleus physics, mesic atoms and mesic nuclei are considered to be very interesting objects in the two points of view, *the strongly interacting exotic many body systems* and *the laboratories for the study of the hadron properties at finite density*.

In this contribution, I would like to introduce the various interests of meson-nucleus systems in the context of the symmetries of the strong interaction, and report the recent theoretical results for the formation reactions for meson-nucleus systems, especially for the η -mesic nuclei. [1-3]

- [1] H. Nagahiro, D. Jido and S. Hirenzaki, "Formation of eta-mesic nuclei by (π ,N) reaction and $N^*(1535)$ in medium," Phys. Rev. C **80** (2009) 025205 [arXiv:0811.4516 [nucl-th]].
- [2] P. Moskal [COSY-11 Collaboration and WASA-at-COSY Collaboration], "Search for the eta-mesic helium at COSY," arXiv:0909.3979 [nucl-ex].
- [3] H. Fujioka and K. Itahashi, "Baryon resonance production in the $\pi + d$ reaction and search for η -mesic nuclei at J-PARC," arXiv:1002.0201 [nucl-ex].

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