

Search for the η -mesic bound states with the WASA-at-COSY detector

Tuesday, 12 June 2018 09:00 (0:30)

Collaboration

WASA-at-COSY

Abstract content

The possible existence of η -mesic nuclei where the η meson is bound with nucleus via the strong interaction, initially postulated by Haider and Liu [1] over thirty years ago, is intensively debated by the scientific community. Some theories predict that η N interaction is strong enough to form bound states even for the light nuclei like helium, however there are still no model independent calculations which would really help to judge whether this exotic kind of nuclear matter exists or not. The bound states have been searched in many experiments. Nevertheless, till now there is no clear evidence confirmed empirically its existence. There are only signals which might be interpreted as indications of the η -mesic nuclei.

The experiments dedicated to the search for η -mesic helium were performed with high statistics using WASA detection setups installed at the COSY accelerator in the Research Center Juelich. The search for the η -mesic bound states is conducted via the measurement of the excitation function for selected decay channels of the He- η systems using unique ramped beam technique [2,3]. In the talk, we present experimental method and recent status of the data analysis.

[1] Q. Haider, L.C. Liu, Phys. Lett. B172 (1986) 257.

[2] P. Adlarson, et al., Phys. Rev. C87, 035204 (2013).

[3] P. Adlarson, et al., Nucl. Phys. A959, 102 (2017).

Primary author(s) : SKURZOK, Magdalena (Jagiellonian University)

Presenter(s) : SKURZOK, Magdalena (Jagiellonian University)

Session Classification : Plenary Session