

Abstract Submitted  
for the HAW14 Meeting of  
The American Physical Society

**Future plans for missing-mass spectroscopy experiment of  $\eta'$  mesic nuclei at FAIR<sup>1</sup>** HIROYUKI FUJIOKA, Kyoto University,  $\eta$ -PRIME COLLABORATION — The mass of an  $\eta'$  meson at finite density is expected to decrease from the in-vacuum one, due to partial restoration of chiral symmetry. If this is the case, a bound state of an  $\eta'$  meson and a nucleus may exist. In order to investigate this system, we are performing a missing-mass spectroscopy experiment at GSI-SIS, making use of the  $(p, d)$  reaction. Both high-statistics and high-resolution measurement can be realized by taking advantage of an intense primary proton beam supplied by the SIS-18 synchrotron and the fragment separator (FRS) used as a spectrometer. The first experiment (GSI S-437) will take place in July-August, 2014. Furthermore, we will proceed with a series of experiments at FAIR, which is under construction. Compared with the GSI experiment, a semi-exclusive measurement of the  $(p, dp)$  reaction, in which protons from the decay of  $\eta'$  mesic nuclei will be detected simultaneously so as to improve the signal-to-noise ratio, will be enabled by installing an additional counter system near the target. In addition, we will accumulate much higher statistics in an inclusive measurement with an upgraded DAQ. In this contribution, we will discuss these future plans, based on very preliminary results of the first GSI experiment.

<sup>1</sup>This work is partly supported by the Grant-in-Aid for Young Scientists (A) (No. 25707018) from Japan Society for the Promotion of Science (JSPS), Japan.

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Date submitted: 26 Jun 2014

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