

Abstract Submitted  
for the HAW09 Meeting of  
The American Physical Society

**$\eta$  meson production in nucleus and observation of in-medium behavior of  $N^*(1535)$**  HIDEKO NAGAHIRO, Nara Womens University, DAISUKE JIDO, YITP, Kyoto University, SATORU HIRENZAKI, Nara Womens University — The study of the in-medium hadron properties is one of the important subjects in nuclear physics. It would provide us useful information on chiral symmetry in finite density. In this contribution, we investigate the properties of the  $\eta$ -nucleus interaction in chiral models and discuss the possible observation of the in-medium behavior of the  $N^*(1535)$  resonance in experiments. The strong coupling of the  $\eta N$  system to  $N^*$  enables us to investigate the in-medium properties of  $N^*$  through the  $\eta$  meson production in nuclei. For in-medium properties of  $N^*$ , there are some theoretical models paying respects to chiral symmetry. In the chiral doublet model, in which  $N^*$  is regarded as a chiral partner of nucleon, the effect of the partial restoration of chiral symmetry reduces the mass difference of  $N$  and  $N^*$  in the nuclear medium. On the other hand, the chiral unitary model, in which  $N^*$  is introduced as a resonance dynamically generated by meson- baryon scattering, predicts almost no mass shift of  $N^*$  in nuclear matter. To investigate the in-medium properties of  $N^*$ , we would like to discuss the formation probability of the  $\eta$  mesic nuclei by using the missing mass spectroscopy and also investigate the production reaction of the  $\eta$  meson off nuclei that has a different kinematics from the former reaction.

Hideko Nagahiro  
Nara Womens University

Date submitted: 30 Jun 2009

Electronic form version 1.4