

Proceedings of the 3rd China-Japan-Korea Hardron and Nuclear Physics 2008 Symposium

Level Crossing of  $N^*(1535)$ -hole and  $\eta$  Modes and Partial Restoration of Chiral Symmetry in  $\eta$  mesic Nuclei

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收稿日期 修回日期 网络版发布日期 接受日期

**摘要** We investigate the properties of the  $\eta$  nucleus interaction by postulating the  $N^*(1535)$  dominance for  $\eta N$  system. Since the mass gap of  $N^*$  and  $N$  is very close to the  $\eta$  meson mass, there is the possibility of the level crossing between the  $N^*$  h and  $\eta$  modes in finite density. We postulate the  $N^*(1535)$  resonance for the  $\eta N$  system and consider quite distinct  $N^*$  properties in finite density which are predicted by two independent chiral models. We find that we can obtain clearer information on the in medium  $N^*$  properties and also on the  $\eta$  nucleus interaction through the formation of the  $\eta$  mesic nuclei by  $(\pi, N)$  reactions under the appropriate experimental conditions, which can be performed at existing and/or forthcoming facilities like J PARC.

**关键词** [A eta mesic nuclei](#) [N\\*\(1535\) in medium](#) [partial restoration of chiral symmetry](#)

分类号

**DOI:**

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