

## Precision spectroscopy of deeply bound pionic states in $^{121}, ^{116}\text{Sn}$

*Friday, 29 July 2016 14:15 (30 minutes)*

We report our recent experiment of the pionic  $^{121}, ^{116}\text{Sn}$  atom using missing-mass spectroscopy of the  $^{122}, ^{117}\text{Sn}(d, ^3\text{He})$  reaction near the charged pion emission threshold. An established approach for quantitative evaluation of the chiral symmetry breaking in finite density is study of pion-nucleus interaction through the experimental measurement of pionic atoms. So far the  $1s$  pionic states in  $^{205}\text{Pb}$  and  $^{115}, ^{119}, ^{123}\text{Sn}$  have been discovered at GSI. The deduced chiral order parameter was compared with that of the vacuum, which was deduced from the pionic hydrogen and deuterium, and partial chiral restoration was suggested. However, the evaluation still had large systematic and statistical errors. For the further study of the symmetry breaking in medium, we performed precision spectroscopy of deeply bound pionic states in  $^{121}, ^{116}\text{Sn}$  at RIKEN, RI Beam Factory in June 2014. The current status of the analysis will be reported.

**Presenter:** NISHI, Takahiro (RIKEN Nishina center)

**Session Classification:** Meson-Nucleon Interactions