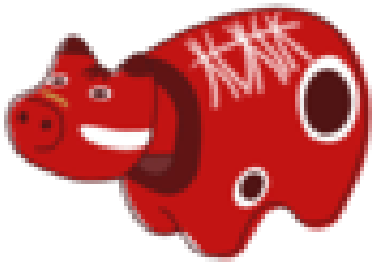

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Study of triaxiality of ^{154}Sm by low-energy electron scattering

Wednesday, 5 March 2025 15:41 (1 minute)

In the 1950s, Bohr and Mottelson established the picture that most heavy nuclei deform into a prolate shape consisting of one long axis and two short axes of equal length.
However, the recent theoretical calculation by T. Otsuka et al.[1] indicates that these nuclei prefer a triaxial shape, with all three axes having different lengths. Additionally, the presence of excited states due to rotational bands in the short-axis plane caused by triaxial asymmetry has also been suggested.
While ^{154}Sm has long been regarded as a prolate nucleus, calculations by T. Otsuka et al. show that it weakly deforms into a triaxial shape, suggesting the existence of the excited state, $2^+_{g\gamma}$, around E_x = 2.7 MeV. By measuring this excited state through low-energy electron scattering, we can determine the total angular momentum of this state by the momentum transfer dependence of the form factor.
The experiment to measure this excited state is planned at RARiS, Tohoku University. We performed the test experiment in November 2024.
From the measurement at 92° and beam energy 60 MeV, We didn't find peak of expected transition strength around $E_x = 2.7$ MeV.
This work will discuss the results obtained in this experiment and future studies.

Reference
[1] T. Otsuka et al., 2024, arXiv:2303.11299.

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Type of contribution

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