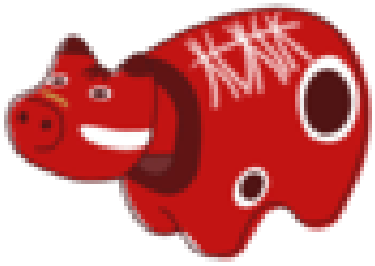

Contribution ID: **17** Type: **not specified**

Quadrupole collectivity in low-lying states in neutron-rich N=40 nuclei

Tuesday, 4 March 2025 17:00 (20 minutes)

Recent spectroscopic measurements in neutron-rich $N = 40$ nuclei towards ^{60}Ca give an insight into shell structure in this region [1]. Large-scale shell model calculations [2] predicted a sizable collectivity in ^{60}Ca and the island of inversion extended to ^{60}Ca.
In this contribution, we will present the results of low-lying states in $N = 40$ nuclei by employing the five-dimensional collective Hamiltonian (5DCH) method based on the Skyrme energy density functional. The 5DCH method explicitly treats quadupole degrees of freedom for rotation and vibration. We use the local quasiparticle random phase approximation to include important dynamical correlations to the inertial functions in the kinetic energies that have been ignored in most of the previous related works [3]. The present calculation reproduces the experimental 2_1^+ energy and $B(E2; 2_1^+ \to 0_1^+)$ values. In particular, we discuss the property of the low-lying excited 0^+ state and low $R_{0/2} = E(0_2^+)/E(2_1^+)$ ratio obtained in ^{60}Ca.
[1] M. L. Cortes et al., Phys. Lett. B 800, 135071 (2020).
[2] S. M. Lenzi, F. Nowacki, A. Poves, and K. Sieja, Phys. Rev. C 82, 054301 (2010).
[3] K. Washiyama, N. Hinohara, and T. Nakatsukasa, Phys. Rev. C 109, L051301 (2024).

Type of contribution

Are you a student or postdoc?

no

Primary author: WASHIYAMA, Kouhei (University of Tsukuba)

Presenter: WASHIYAMA, Kouhei (University of Tsukuba)

Session Classification: Session #4