Contribution ID: **51** Type: **Poster Contribution**

The neutron magic number 28 and the structure in neutron-rich nuclei

The magic number 28 appears in the pf shell because of the spin-orbit interaction. However, in some $N \approx 28$ neutron-rich nuclei, the neutron magic number 28 disappears. This leads to the quadrupole deformation of the ground state, the reduction of the excited energies and so on. In what region of the nuclear chart, does the magic number disappear? This is one of the interesting problems. In particular, in $N = 26$ isotones which have less neutrons than closed nuclei, does the effect appear in the low-lying energy spectra? Then, we apply the antisymmetrized molecular dynamics (AMD) combined with the generator coordinate method (GCM), and study the structure of $N = 26$ isotones.

As a result, we found that 44Ar and 40Si have triaxially deformed shape, and 42S has prolate-deformed shape at the ground states. In addition, we found that several 2^+ states appear at low energies in these nuclei. It suggests that they are unstable against the deformation parameter γ.

Furthermore, we found that the rotational bands appear on the low-lying excited 0^+ states in 44Ar and 40Si. In these bands, 44Ar has prolate-deformed shape and 40Si has oblate-deformed shape. As a result of the analysis of the single particles, we found that around 40% of last neutrons occupy the p orbits in the oblate-deformed states of 40Si.
It suggests the reduction of the energy gap in the neutron magic number 28.

Summary

Primary author: SUZUKI, Yoshiki (Hokkaido Univ.)

Co-author: Dr KIMURA, Masaaki (Hokkaido University)

Presenter: SUZUKI, Yoshiki (Hokkaido Univ.)