Shape coexistence and non-yrast states in neutron-rich N=28 isotopes

M. Kimura, Y. Taniguchi\textsuperscript{a}, Y. Kanada-En’yo\textsuperscript{b}

Department of Physics, Hokkaido University, Sapporo, 060-0810
\textsuperscript{a}Center for Computational Sciences, University of Tsukuba, Tsukuba 305-8571
\textsuperscript{b}Department of Physics, Kyoto University, Kyoto, Kyoto 606-8502, Japan

masaaki@nucl.sci.hokudai.ac.jp

The broken magic number of N=28 in the isotopes far from stability have been topics of interest and importance. Because of the shell erosion in these isotopes, the shape coexistence and non-yrast states with small excitation energies have been expected.

In this talk, we focus on the shape coexistence phenomena in the vicinity of the neutron-rich N=28 isotopes based on the studies by the antisymmetrized molecular dynamics (AMD) \cite{kimura2013}. The following two topics will be discussed in our presentation.

1. Prolate, oblate and triaxial shape coexistence in neutron-rich N=28 isotopes which is triggered by the quenching of the N=28 shell gap and strong proton-neutron correlation (Fig. 1).

2. Evolution of the excited $0^+$ states as function of the proton and neutron numbers which are regarded as the signature of the shape coexistence phenomena in the vicinity of the neutron-rich N=28 isotopes.


Figure 1: Calculated and observed spectra of $^{43}$S which manifests the prolate, oblate and triaxial deformed shape coexistence.