

## **In-beam gamma-ray spectroscopy of F and Ne isotopes near the island of inversion**

It is known that neutron magic number  $N=20$  disappears in the region of  $Z=10\sim 12$ . Study of nuclei in this region, called “island of inversion” is important for understanding the evolution of shell structure in neutron-rich region. Neutron-rich F and Ne isotopes are located at the south boundary of the island of inversion. Due to the difficulty in production of these extremely neutron-rich nuclei, available experimental data are not sufficient.

We performed in-beam gamma-ray spectroscopy of the neutron-rich  $^{29}\text{F}$ ,  $^{28-30}\text{Ne}$  generated by inelastic scattering and single-nucleon removal reactions on a liquid hydrogen target at the RIKEN RI Beam Factory.  $^{29}\text{F}$ ,  $^{29,30}\text{Ne}$  secondary beams were generated by projectile fragmentation of a  $^{48}\text{Ca}$  primary beam on a beryllium target at a beam energy of 345 MeV/u. High statistical data was obtained by using MINOS, which consists of 15 cm thick liquid-hydrogen target and recoil-proton tracking detector. Outgoing particles were identified by SAMURAI spectrometer. The de-excitation gamma rays were measured with the NaI(Tl) scintillator array DALI2 arranged to surround the target.

We studied high-lying excited states and gamma-gamma coincidences for decay from the populated nuclei. In case of nucleon-removal reactions of  $^{29,30}\text{Ne}$ , partial cross sections have also been investigated. In this presentation, we discuss the nuclear structure of these nuclei based on the experimental results.

### **Summary**

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