

# Spectroscopy of $^{52}\text{Ar}$ and $^{56}\text{Ca}$ with DALI2 and MINOS

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In the context of nuclear structure evolution with isospin towards the drip-line and local magic numbers phenomena, gamma-spectroscopy of nuclei located in the neutron-rich region around  $^{54}\text{Ca}$  is intensively investigated. Indeed, shell-model calculations using the GXPF1 interaction have indicated a new sub-shell closure at  $N=34$ . However, this is not confirmed experimentally by the  $2+$  excitation energy of  $^{58}\text{Cr}$  and  $^{56}\text{Ti}$ , and other shell-model interactions and mean-field calculations do not predict this sub-shell closure. The important role of 3-body force in explaining shell-closures is suggested by recent ab-initio calculations. Recently, the gamma-spectroscopy of  $^{54}\text{Ca}$  was measured at RIKEN to obtain evidence for the  $N=34$  new sub-shell closure. The preliminary results do not indicate high  $2+$  excitation energy.

To further investigate this region, we propose to measure the gamma-spectroscopy of  $^{52}\text{Ar}$  and  $^{56}\text{Ca}$ . Since these nuclei are very neutron-rich, they are produced at few particles per second only, making their spectroscopy measurement challenging. The measurements in a reasonable time could be possible by using MINOS coupled to the high-efficiency gamma-spectrometer DALI2. In this talk we will discuss the feasibility of measuring  $^{52}\text{Ar}$  and  $^{56}\text{Ca}$  spectroscopy with the DALI2-MINOS setup.

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