

Onset of collectivity for argon isotopes close to $N = 32$

The neutron number $N=32$ has been recently proposed to be a new magic number for neutron-rich nuclei far from stability, such as ^{52}Ca . This statement relies on different experimental measurements, such as mass-measurements, high excitation energy for the first $2+$ state of even-even nuclei and low $B(E2)$ values. The calcium isotopic distribution is well documented, in addition with many theoretical calculations, with a strong influence of the closed proton core at $Z = 20$. Persisting - although weakened - shell effects are still observed for higher Z isotopic distributions, such as titanium or chromium isotopes, in competition with increasing collective effects. Very few data exist for Z lower than 20.

We will present an analysis of the one neutron removal reaction $^{50}\text{Ar}(p,pn)$ in inverse kinematics performed at RIKEN with the liquid hydrogen target of the MINOS device, the DALI2+ array for detection of photons and the SAMURAI spectrometer. A first spectroscopy of ^{49}Ar has been proposed for low-lying bound states and compared with state-of-the-art theoretical calculations. Differences from a closed shell nucleus such as ^{51}Ca and importance of collective effects will be emphasized.

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