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Nuclear properties and exotic structure of ^{81,82}Zn isotopes beyond N = 50

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Rich nuclear structure phenomena, such as shape coexistence and shell evolution, have been observed in the neutron rich region up to N = 50 around ^{78}Ni [1-4]. Moving to more neutron-rich nuclei, theoretical calculation shows that the shell evolution and deformation will also appear in the ground states of isotopes beyond N = 50 [4-6]. Nuclear spins, electromagnetic moments and charge radii of the ground states of these neutron-rich nuclei, which are accessed by laser spectroscopy techniques, would provide important information on theoretically-predicted exotic structure. However, due to the low production yield of neutron-rich isotopes in the northeast of ^{78}Ni, as well as the accompanying large isobaric contamination, measurement of ground-state properties in this region using laser spectroscopy has been limited till now.

Recently, thanks to the strong rubidium suppression by using a quartz transfer line in the ISOLDE target, and the high sensitivity and selectivity of the Collinear Laser Spectroscopy (CRIS) technique [7,8], measurements of ^{81,82}Zn (N = 51,52) close to the ^{78}Ni have been performed successfully. This leads to the first determination of the nuclear spin and electromagnetic moments of ^{81}Zn and the charge radii of ^{81,82}Zn. In this talk, the details of the CRIS experiment as well as the extracted nuclear properties of the ^{81,82}Zn isotopes will be presented. The experimental results will be further discussed based on the on-going shell model and ab-initio calculations.

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