

Workshop on Active Targets and Time Projection Chambers for  
High-intensity and Heavy-ion beams in Nuclear Physics

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## Active target MAIKo and measurement of $^{10}\text{C}(a,a')$ at 75 MeV/u

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Alpha cluster structures have been widely examined in self conjugate  $A=4n$  nuclei. With the recent developments of new accelerator facilities, studies on neutron/proton rich nuclei became feasible. In such nuclei, excess neutrons/protons are predicted to occupy the molecular orbitals between alpha cores and yield variety of the molecular structures. Missing mass spectroscopies with alpha inelastic scatterings have been successfully performed to measure and to search for alpha cluster states in stable nuclei. Therefore, measurements of alpha inelastic scatterings under inverse kinematics conditions should be carried out for unstable nuclei. However, such a measurement requires the detection of low-energy ( $\sim 1$  MeV) recoil alpha particles which is not possible with an external target.

To overcome this problem, we have developed an active target system MAIKo at RCNP. The system is based on a time projection chamber (TPC) with maicro-pixel chamber ( $\mu$ -PIC). We have performed several test experiments using stable beams to study the detector performances under high counting rate. The first RI beam experiment with a  $^{10}\text{C}$  beam at 75 MeV/u was performed in November 2017 at RCNP.

In this presentation, the setups and results of the test experiments will be discussed, and some of the preliminary results of the  $^{10}\text{C}$  experiment will be presented.

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