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Recent experimental results of KEK Isotope Separation System (KISS)

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KEK Isotope Separation System (KISS) is a laser ion source with an argon gas cell, we have been developing at RIKEN RIBF facility [1,2]. The KISS project is motivated by the systematic nuclear spectroscopy of neutron-rich nuclei at the north-east part of the nuclear chart, that is from around neutron-magic number 126 to the trans-uranium region. The systematic studies of lifetimes, masses, beta-gamma spectroscopy and laser spectroscopy of those nuclei will provide information of nuclear structures, which is crucial inputs to the theoretical predictions of nuclear parameters included in the the simulation of r-process nucleosynthesis, its astrophysical environments remain unrevealed yet.

KISS has an argon gas cell which is optimized to efficiently collect and extract nuclear products in the multi nucleon transfer (MNT) reactions, which are considered to be appropriate mechanism to produce neutron-rich nuclei of interest [3,4]. The employment of a doughnut-shaped gas cell with high-vacuum condition of the primary beam line improved the extraction efficiency [5]. The laser resonance ionization technique is used to element-selectively ionize the element of interest. Those photo-ions are transported by RF ion guides through the differential pumping area and are finally accelerated by a high voltage to select one species of isotopes with a mass separator. In-gas-cell and in-gas-jet laser ionizations are utilized at KISS.

In this presentation, we will report the present status, the recent experimental results and the future plan of KISS.

[1] Y. Hirayama et al., Nucl. Instrum. and Methods B 353 (2015) 4.
[2] Y. Hirayama et al., Nucl. Instrum. and Methods B 376 (2016) 52.
[3] Y.H. Kim et al., EPJ Web of conferences 66 (2014) 03044.
[4] Y.X. Watanabe et al., Phys. Rev. Lett. 115 (2015) 172503.
[5] Y. Hirayama et al., Nucl. Instrum. and Methods B 412 (2017) 11.

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