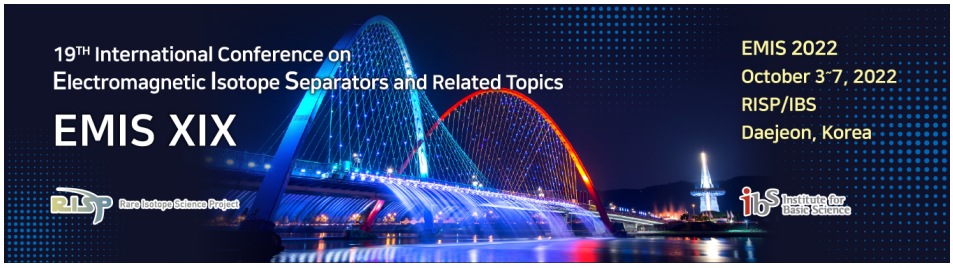

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Development of the collinear laser spectroscopy system for the study of unstable nuclei at BRIF facility

Friday, 7 October 2022 10:00 (20 minutes)

Collinear laser spectroscopy is a powerful tool for the study of the basic properties, such as the spins, magnetic moment, electric quadrupole moments and charge radii, and the related structure of exotic nuclei far from β-stability line [1]. In order to study these properties of unstable nuclei at Radioactive Ion-beam Facility in China, we have developed a collinear laser spectroscopy (CLS) system, which has been tested by using the stable Ca ion beams produced from a laser ablation ion source [1]. This CLS system has been recently installed at the Beijing Radioactive Ion-beam Facility (BRIF) [2]. The first successful on-line commissioning experiment of this system was performed by measuring the hyperfine structure of stable (39K) and unstable (38K) ion beams, in the continuous mode, produced at BRIF facility. This on-line experiment demonstrates the overall functioning of this CLS system, which opens new opportunities for laser spectroscopy measurement of unstable isotopes at BRIF and other radioactive ion beam facilities in China.

In this talk, the technique details of the CLS setup and the offline/online commissioning experiments, together with the on-going development of the collinear resonance ionization spectroscopy and RFQ cooler buncher, will be presented. The future scientific prospect of the CLS setup at BRIF will be discussed.
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