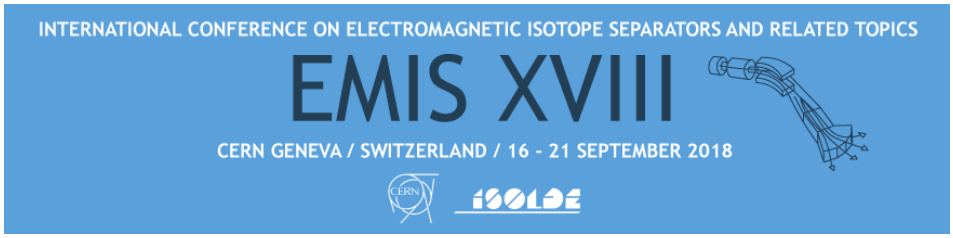

Contribution ID: **121** Type: **Submitted Oral**

Collinear laser spectroscopy at the IGISOL facility: upgrades and new opportunities

Wednesday, 19 September 2018 11:55 (15 minutes)

Collinear laser spectroscopy is an established tool for the study of electromagnetic moments, charge radii and nuclear spins. With a history that now spans 4 decades, the technique has been successfully applied in laboratories all over the world. Recently, several upgrades were performed at the Ion Guide Isotope Separator On-Line (IGISOL) facility, Jyväskylä. Chief among these upgrades are a new event-by-event data acquisition system, and a new charge exchange cell. These developments will expand the applicability of the method significantly, and will in particular enable studies of the late d-shell species like Tc-Pd. No measurements on radioactive isotopes of these elements have been reported so far which reflects the challenge of producing such refractory species at ISOL-based facilities

In parallel to the developments at the collinear laser spectroscopy station, modifications of the radiofrequency cooler-buncher at the IGISOL are underway. The goal of these upgrades is to reduce the temporal length of the ion bunches. This is required to reach optimal mass-resolving power with the new Multi-Reflection Time-of-Flight (MR-TOF) device which is also currently being built and commissioned. Since an increase in the energy spread of the ions will result in a broadening of the resonance lines in collinear laser spectroscopy, collinear laser spectroscopy presents a unique tool to investigate the time- and energy spread of the bunches produced with this upgraded cooler-buncher.

In this contribution, the aforementioned upgrades will be discussed in detail. The performance of the upgraded cooler-buncher, evaluated using collinear laser spectroscopy, will be summarized. The implications of all these upgrades for the future physics program will be explored

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Session Classification: Session 10 - Laser techniques

Track Classification: Ion traps and laser techniques