



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 2581 Type: **Oral not-in-competition (Graduate Student) / Orale non-compétitive (Étudiant(e) du 2e ou 3e cycle)**

Resonance Ionization Laser Ion Source – pure radioactive ion beams & in-source laser spectroscopy

Tuesday, June 4, 2019 11:00 AM (15 minutes)

In-source laser resonance ionization spectroscopy aims to drastically increase the resonant laser ionization efficiency for element species. This can be achieved by finding auto-ionizing (AI) states suitable for laser resonance ionization. Isotope separator on-line (ISOL) facilities such as the isotope separator and accelerator (ISAC) at TRIUMF produce a wide variety of exotic radio-isotopes for experiments on nuclear structure, astrophysical processes and material sciences. These facilities are ideally suited for fundamental research on nuclear structure but also are the place to perform atomic spectroscopy in search of energy levels of radioactive elements. The study of atomic transitions along long chains of isotopes of a particular element allows also to study the evolution of nuclear charge radii as a function of neutron number via the hyperfine interaction. The TRIUMF resonance ionization laser ion source (TRILIS) is an efficient tool to provide pure ion beams using the element selective resonance ionization process and an instrument for ultra-sensitive atomic spectroscopy by means of laser resonance ionization. .

For laser ionization scheme development on stable isotopes and ion source development, an off-line test stand was built and is being operated in parallel to the on-line laser ion source. This allows to conduct the required instrumentation developments for forefront experiments with rare isotopes in the service of nuclear physics experiments.

Primary authors: MOSTAMAND, Maryam (University of Manitoba- TRIUMF); LI, Ruohong (TRIUMF); ROMANS, Jekabs (KU Leuven); REICH, Bianca (TRIUMF, U Heidelberg, Germany); LASSEN, Jens (TRIUMF, Simon Fraser university, U of M)

Presenter: MOSTAMAND, Maryam (University of Manitoba- TRIUMF)

Session Classification: T2-11 General Instrumentation (DAPI) | Instrumentation générale (DPAI)

Track Classification: Applied Physics and Instrumentation / Physique appliquée et de l'instrumentation (DAPI / DPAI)