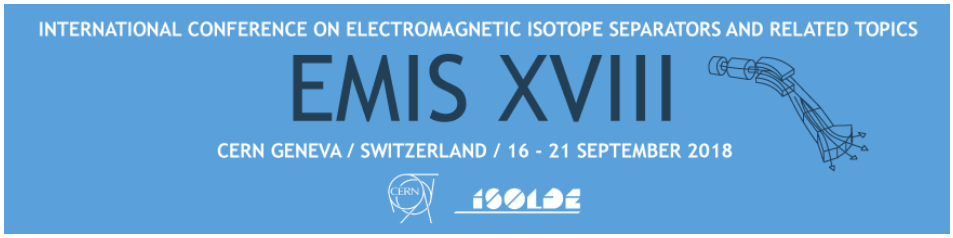

Contribution ID: **109** Type: **Poster**

A NEW OFF-LINE ION SOURCE FACILITY AT IGISOL

Monday, 17 September 2018 17:59 (1 minute)

A NEW OFF-LINE ION SOURCE FACILITY AT IGISOL

M. Vilén and the IGISOL group

Department of Physics, University of Jyväskylä, P.O.B. 35 (YFL), FIN-40014, Finland
email: markus.k.vilen@student.jyu.fi

A new beamline for off-line ion sources has been commissioned at the IGISOL [1] (Ion Guide Isotope Separator On-Line) facility at the University of Jyväskylä, Finland. It allows parallel operation of off-line ion sources and production of radioactive ion beams while offering a flexible platform for producing a variety of stable ion beams. Parallel operation opens up a range of new possibilities for measurements at IGISOL. The new system has been used to provide doubly charged $^{89}Y^{2+}$ ions for laser spectroscopy measurements during on-line operations [2] and singly charged $^{133}Cs^{+}$ ions for off-line testing of a magneto-optical trap under development at IGISOL [3]. Ions for these measurements were produced using a glow discharge ion source and a surface ion source, respectively. The system will also be used to provide reference ions for on-line Penning trap mass measurements with JYFLTRAP [4] in the near future.

While the off-line ion source station is operational and has been used in several measurements, technical development of the system is still ongoing with the aim of increasing ion yields and the number of ion species available for experiments. The development effort has been mainly focused on the glow discharge ion source with the construction of a buffer gas purification system and presently ongoing design work of a new vacuum system.

In this contribution, the layout and technical details of the offline ion source facility at IGISOL will be given together with examples of its applications and future prospects.

References

[1] I.D. Moore, T. Eronen, D. Gorelov, J. Hakala, A. Jokinen, A. Kankainen, V.S. Kolhinen, J. Koponen, H. Penttilä, I. Pohjalainen, M. Reponen, J. Rissanen, A. Saastamoinen, S. Rinta-Antila, V. Sonnenschein, and J. Äystö. Towards commissioning the new IGISOL-4 facility. Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, 317:208 –213, 2013. XVIth International Conference on ElectroMagnetic Isotope Separators and Techniques Related to their Applications, December 2–7, 2012 at Matsue, Japan.

[2] L. J. Vormawah, M. Vilén, et al. Isotope shifts from collinear laser spectroscopy of doubly-charged yttrium isotopes. Manuscript submitted for publication to Physical Review A, 2018.

[3] Luca Marmugi, Philip M. Walker, and Ferruccio Renzoni. Coherent gamma photon generation in a Bose–Einstein condensate of 135mCs. Physics Letters B, 777:281 –285, 2018.

[4] T. Eronen, V. S. Kolhinen, V. V. Elomaa, D. Gorelov, U. Hager, J. Hakala, A. Jokinen, A. Kankainen, P. Karvonen, S. Kopecky, I. D. Moore, H. Penttilä, S. Rahaman, S. Rinta-Antila, J. Rissanen, A. Saastamoinen, J. Szerypo, C. Weber, and J. Äystö. JYFLTRAP: a Penning trap for precision mass spectroscopy and isobaric purification. The European Physical Journal A, 48(4):46, Apr 2012

Primary author: VILEN, Markus (University of Jyväskylä)

Presenter: VILEN, Markus (University of Jyväskylä)

Session Classification: Poster Session 1

Track Classification: Instrumentation for radioactive ion beam experiments