

The next order of magnitude in precision and resolution at JYFLTRAP

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JYFLTRAP is a double Penning trap setup in the accelerator laboratory of University of Jyväskylä dedicated primarily for atomic mass measurements of exotic ions and for providing clean samples of ions for decay spectroscopy studies. The setup has been operational for more than a decade utilizing time-of-flight ion-cyclotron resonance (TOF-ICR) technique for atomic mass measurements and various Penning trap cleaning techniques for ion beam cleaning.

Recently we have commissioned the new novel phase-imaging ion-cyclotron (PI-ICR) resonance technique, which has now been used successfully for mass measurements at JYFLTRAP. This technique offers nearly one order of magnitude improvement in obtainable precision. We have demonstrated that this technique is also suitable for separating very low-lying nuclear isomeric states.

We are also constructing a multi-reflection time-of-flight (MR-TOF) separator, which will bring a tenfold enhancement for handling unwanted contaminant ions. In this presentation I will show capabilities of these new techniques and some physics cases measured with the PI-ICR technique.

Primary authors: Dr ERONEN, Tommi (University of Jyväskylä); CANETE, Laetitia (University of Jyväskylä); Prof. JOKINEN, Ari; KANKAINEN, Anu (University of Jyväskylä); Prof. MOORE, Iain D.; Dr NESTERENKO, Dmitrii (University of Jyväskylä); Dr DE ROUBIN, Antoine; Mr VILEN, Markus (University of Jyväskylä)

Presenter: Dr ERONEN, Tommi (University of Jyväskylä)

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