

Status of the ISOLDE MR-TOF project for advanced beam purification

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With the continuous development of experimental techniques at radioactive ion beam (RIB) facilities, the demand for high quality ion beams is ever increasing. Significant isobaric contamination levels commonly present in RIBs have proven to be a major challenge, preventing the study of the most exotic isotopes produced at low energy branches of RIB facilities. Furthermore, as the study of radioactive nuclides reaches ever shorter half lives, fast ion sample preparation becomes highly desirable. Similar challenges with isobaric contamination are encountered also in other applications, such as medical isotope production and solid state physics.

The challenge of combining high ion beam purity with fast sample processing and high ion flux can be met by a Multi-Reflection Time-of-Flight (MR-ToF) Mass Spectrometer operating at an unprecedented 30 keV beam energy, together with a cryogenic Paul trap for ion sample preparation. The system will offer improved ion flux compared to existing MR-ToF devices and deliver ion beams of high isobaric purity to downstream experiments.

In this talk, the status of the ISOLDE MR-ToF project for beam purification will be presented. Performance of the system will be discussed together with its challenges.

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