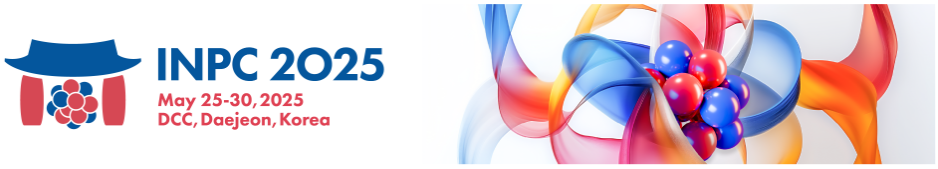

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Recent Developments of the MRTOF-MS at RIBF

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Precise nuclear mass data is fundamental to the study of nuclear structure and provides important inputs for nucleosynthesis calculations. Low production yields and short half-lives of increasingly exotic nuclei have propelled the development of the multi-reflection time-of-flight mass spectrograph (MRTOF-MS) to become a leading method for high precision mass measurement. By reflecting low energy ions several hundred times between a pair of electrostatic mirrors, the MRTOF-MS produces an extremely long effective travel path. The MRTOF-MS is able to achieve a mass resolving power of m/Δm = 10^6 with flight times in the range of milliseconds [1], which makes it an attractive candidate for measurements of short-lived nuclei and their isomers. Indeed, the MRTOF-MS has been used as isobar separators and mass spectrometers [2–4] with many more being constructed at accelerator facilities. The stable high-voltage operation of the MRTOF-MS has been a crucial factor in its success. Currently, one of the many challenges of the MRTOF-MS is the voltage instability introduced by high frequency switching of electrodes during trapping and releasing of ions. This leads to undesirable mass dependent effects, limiting the operational range of the MRTOF-MS.
In this contribution, I will give a short overview of some developments of the MRTOF-MS at RIKEN to improve mass resolving power and operational stability, as well as a brief look at further plans for improvements in the future.

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