TRIUMF Advanced Rare Isotope Laboratory (ARIEL)

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Experience of TITAN's MR-TOF-MS at ISAC and its potential capabilities at ARIEL

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The multiple-reflection time-of-flight mass spectrometer (MR-TOF-MS) has been part of the TRIUMF's Ion Trap for Atomic and Nuclear Science for about 9 years. Coupled to the ISAC facility for the delivery of rare isotope beams (RIBs) plenty of results have been shown, from extending the landscape of known nuclear masses to aiding for the development of ion sources and targets. Within the ARIEL era, extreme neutron rich nuclei will be produced via photofission with more rate and with less isobaric contamination compared to ISAC yields. ARIEL production rates employing photofission together with the already demonstrated capabilities of the MR-TOF-MS for supressing contaminants via re-trapping, open opportunities of further expanding the known nuclear masses towards neutron rich nuclei in the light and heavy fission peaks. Also, the MR-TOF-MS will enable real-time yield measurements and beam composition characterization, which will enable characterization and optimization of the new production targets (APTW and AETE) and enable new developments.

In this presentation I will give a brief overview of the MR-TOF-MS technique and its achievements in TRIUMF coupled to the ISAC facility and an outlook for the opportunities of the MR-TOF-MS in the ARIEL era.

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Session Classification: Perspectives on rare isotope experiments at ARIEL with ion trapping & manipulation