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High Resolution Isobar Separator for Study of Exotic Decays V. SHCHEPUNOV, ORAU, A. PIECHACZEK, LSU, H.K. CARTER, ORAU, E.F. ZGANJAR, LSU, J. BATCHELDER, S.N. LIDDICK, ORAU, H. WOLLNIK, JIHIR, Y. HU, Grinnell College and ORAU — A Multi-pass Time-Of-Flight mass spectrometer and separator (MTOF) was designed and built by the UNIRIB Consortium. The MTOF spectrometer consists of two coaxial electrostatic mirrors and auxiliary focusing, injection, and extraction elements. Ions of different mass are reflected multiple times between the mirrors and separated longitudinally. Using a test ion source, a mass resolving power of 29,000 (FWHM) has been achieved. The agreement between simulated and measured properties of the MTOF spectrometer is very good. MTOF will be converted into a mass separator by adding a fast electrostatic switch of the Bradbury-Nielson type. It will be initially coupled to the online isotope separator, UNISOR, at HRIBF to provide isobaric pure samples of exotic species in the ^{100}Sn region or neutron-rich nuclei for decay studies. Our ion optic calculations indicate a mass resolving power $\geq$ 15,000 and efficiencies of 30-50%. Ion optic design principles and hardware specifications from numerical simulations will be presented. The proposed RIB injection with beam cooling and bunching from the UNISOR separator into this new, compact isobar separator will be described.

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