

Abstract Submitted  
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**Ion Optic Simulation of Ion Source and Beam Transport for Isotope Separator at HRIBF** YUAN HU, V.A. SHCHEPUNOV, H.K. CARTER, UNIRIB, ORAU, Oak Ridge, TN, A. PIECHACZEK, LSU, LA — To conduct decay spectroscopy experiments on isobarically pure sources, a compact high resolution ( $>15,000$ ) isobar separator is being designed and built. The device is based on the Multi-Pass Time-of-Flight (MTOF) principle and the separation feature is realized by a fast electrostatic Bradbury-Nielson gate<sup>1</sup>. MTOF mass separator (MS) will be coupled to the on-line isotope separator UNISOR at HRIBF. In order to design appropriate injection optics for MTOF MS, we need to know the properties of the incoming beam, namely the beam emittance and center position. Therefore, we use the 3D simulation code SIMION 8.0 to study the ion extraction within an Electron Beam Plasma ion source, and the beam transport through an extractor and a focusing lens system. The beam simulation and analysis code COSY INFINITY is used to trace the extracted beam through the UNISOR beam line until the position where MTOF MS will be installed. This study evaluates the sensitivity of final beam phase space distribution on initial conditions. Possibilities of adjusting the ion source and beam line settings to get desirable beam parameters at the entrance to MTOF MS are investigated.

<sup>1</sup>Bradbury, N.E.; Nielsen, R.A. Phys. Rev. 1936, 49, 388-393

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