



Contribution ID: 148

Type: **Poster Presentation**

Experimental Test of Momentum Compression in an Achromatic Fragment Separator

Tuesday, 12 May 2015 17:01 (0 minutes)

The efficient collection of projectile fragments and fission fragments with in-flight separators in many cases requires a large momentum acceptance. For example, the planned Advanced Rare Isotope Separator (ARIS) [1] at the future Facility for Rare Isotope Beams at Michigan State University has a 10% momentum acceptance. Such broad momentum distributions can be compressed using appropriately shaped energy degraders [2], and these energy degraders can be used to generate mass-separation at the same time [3]. Here we report on an experimental test of this momentum-compression scheme using the A1900 fragment separator [4] at the National Superconducting Cyclotron Laboratory with dedicated wedge-shaped energy degraders and a matching beam optics setting. The energy distribution of the beam after momentum compression was measured with a stack of semiconductor detectors.

References

- [1] M. Hausmann, et al., Design of the Advanced Rare Isotope Separator ARIS at FRIB, *Nuclear Instruments and Methods in Physics Research B* 317 (2013) 349.
- [2] L. Bandura, et al., Fragment separator momentum compression schemes, *Nuclear Instruments and Methods in Physics Research A* 645 (2011) 182.
- [3] C. Scheidenberger, et al., Energy and range focusing of in-flight separated exotic nuclei - A study for the energy-buncher stage of the low-energy branch of the Super-FRS *Nuclear Instruments and Methods in Physics Research B* 204 (2003) 119.
- [4] D. J. Morrissey, et al., Commissioning of the A1900 projectile fragment separator, *Nuclear Instruments and Methods in Physics Research B* 204 (2003) 90.

Material based on work supported by the US National Science Foundation under cooperative agreements PHY-0606007 and PHY-1102511 and by the US DoE Office of Science under cooperative agreement DE-SC0000661.

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Session Classification: Poster Session B