Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

Design of the SUPERB Recoil Separator[1] ZACHARY JACKSON, LISA CARPENTER, MATT AMTHOR, Bucknell University — The reaccelerator ReA12 upgrade planned at the National Superconducting Cyclotron Lab (NSCL) at Michigan State University will produce higher energy rare isotope beams close to the neutron and proton drip lines. We present one option for the recoil separator which aims to take full advantage of the new capabilities of ReA12 in studying rare isotopes. The Separator for Unique Products of Experiments with Radioactive Beams (SUPERB), patterned after the second half of the Super Separator-Spectrometer (S^3) currently under construction at the Grand Accélérateur National d'Ions Lourds (GANIL). This design includes both electric and magnetic dipoles and this will allow physical separation by mass-to-charge ratio (m/q) with a maximum solid angle of 26msr and a maximum magnetic rigidity of 1.44Tm. This design also allows for flexibility of optical modes. Both large acceptance and unit magnification modes will be presented. Also, a fully magnetic configuration is considered that would eliminate the expected electric rigidity limit of 10MV and increase the maximum magnetic rigidity to 1.92Tm. We will present optical designs and simulations of SUBERB developed in the code COSY Infinity including a first order system and a higher order Monte Carlo calculation simulating ^{100}Sn production.

[1]This research was funded by the NSF REU program, grant PHY-1165694 with additional support from the DoD ASSURE program.

Zachary Jackson
Bucknell University

Date submitted: 30 Jul 2013 Electronic form version 1.4