

Abstract Submitted  
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**Optimized Bunching and Other Improvements to the HIS Ion Source**<sup>1</sup> FREDERICK JUNG, ANI APRAHAMIAN, WANPENG TAN, University of Notre Dame — Ion sources for nuclear accelerators produce a constant stream of particles, but for some nuclear reactions, it is useful to have discrete packets of accelerated particles hit the target. Bunchers create these groups of particles that hit a target at a specific point in time. This project found optimum buncher settings for  $^4\text{He}$  and proton beams at Notre Dame's FN Tandem Accelerator. A tantalum target was bombarded with the  $^4\text{He}$  and the proton beams. The resultant gamma rays were detected by a  $\text{BaF}_2$  detector placed outside the target chamber. In this way, the resolution of each setting could be determined, and ultimately, the optimal resolution could be found. The optimal resolution was found to be 1.82ns for  $^4\text{He}$ , when the buncher was set at 95mV, the sweeper was set at 2V, and the High Voltage Platform was set at 30kV. The optimal resolution for the proton beam was not able to be found, as a clean resolution could not be achieved. This means that a more extensive study of the SNICS ion source needs to be made in an attempt to optimize the beam.

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