

Abstract Submitted
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A windowless gas-cell cooler-buncher at RIKEN/SLOWRI FU-MIYA ARAI, RIKEN Nishina Center, University of Tsukuba, YUTA ITO, ICHIRO KATAYAMA, PETER SCHURY, TETSU SONODA, MICHIHARU WADA, RIKEN Nishina Center, HERMANN WOLLNIK, RIKEN Nishina Center, New Mexico State University — For future experiments at RIKEN/SLOWRI, ion preparation, e.g., cooling and bunching, are indispensable for various precision experiments. The ion beams from SLOWRI gas cells will be continuous with a beam energy of ≤ 30 keV/ q , and must be decelerated and cooled in an ion trap to bunch ions. In order to achieve higher efficiency with much simpler structures than conventional RFQ cooler-buncher [1,2], we are developing an windowless gas-cell cooler-buncher (GCCB). The GCCB consists of a gas cell with a small hole at the entrance and an RF-carpet followed by a flat trap [3]. The GCCB will be cryogenically cooled to ~ 77 K and filled with He gas at up to 2 mbar. According to calculations with TRIM, a stopping efficiency of 100% can be obtained for any ≤ 30 keV/ q beams with $Z > 3$ if the GCCB is at least 420 mm long. A large radial geometry will provide a larger effective acceptance than any conventional RFQ cooler-buncher, allowing for higher efficiency. This will allow further reach into exotic nuclei. We will present current status and future outlook.

- [1] F. Herfurth et al., Nucl. Instrum. Meth. A 469, 254 (2001)
- [2] T. Brunner et al., Nucl. Instrum. Meth. A 676, 32 (2012)
- [3] Y. Ito et al., Nucl. Instrum. Meth. B 317, 544 (2013)

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