Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

Performance of ion surfing rf-carpets for RI beam gas catcher FUMIYA ARAI, University of Tsukuba, YUTA ITO, ICHIROU KATAYAMA, PETER SCHURY, TETSU SONODA, MICHIHARU WADA, RIKEN Nishina Center, HERMANN WOLLNIK, New Mexico State University — High-energy RI beams produced in-flight by fragmentation or fission are used in ion trap-based precision experiments after being stopped in a gas catcher. The stopped ions can be extracted from the gas catcher as a low energy ion beam. In order to transport and extract ions quickly and efficiently, an rf-carpet (RFC) method utilizing a dc potential gradient has been the standard technique [1]. However, such a method is restricted by the transport time to longer half-life isotopes due to the maximum dc gradient that can be supported before electric discharges occur in the gas catcher. To avoid that limitation, a hybrid technique wherein the dc gradient is replaced by a traveling potential wave was proposed, called "ion surfing" [2,3]. Recently, we have demonstrated ion extraction using a circular RFC under low [4] and intermediate pressures. For the first time we demonstrated the ion extraction using an rf-carpet in high-pressure He gas. An efficiency of nearly 100% was obtained at 200 mbar He gas pressure for K^+ ions.

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Date submitted: 30 Jun 2014 Electronic form version 1.4