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## The Ion Surfing Transport Method for Beam Thermalization Devices

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Projectile fragments can be slowed and thermalized in buffer gas to supply rare ions to low energy experiments. I will present studies of “ion surfing” [1], a method for transporting ions through gas-filled devices that uses a RF gradient to repel the ions from the walls. Instead of relying on a fixed potential gradient to guide the thermal ions through the length of the cell, the ions are transported by a traveling wave superimposed on the RF field. The traveling wave is formed by an oscillating sinusoidal field applied to repeating sets of four electrodes. The field on each subsequent electrode is offset by 90 degrees in phase. Transport efficiency and velocity measurements were performed for rubidium and potassium ions over a wide range of conditions. With the optimal parameters currently attainable, >90% efficient transport over 10 cm at 80 mbar was observed for Rb and K ions with max velocities of 75 m/s and 50 m/s, respectively [2]. The measurements were conducted with an arrangement of curved electrodes in preparation for the cyclotron gas cell at the National Superconducting Cyclotron Laboratory at Michigan State University. I will present the results of the measurements and comparisons to detailed simulations.

[1] G. Bollen, Int. J. Mass Spect. 299 (2011) 131

[2] M. Brodeur, A.E. Gehring, et al., Int. J. Mass Spect. 336 (2013) 53

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