

Abstract Submitted
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Ion transport through an X-intersection trap array BRAD BLAKESTAD, NIST, J.M. AMINI, J.W. BRITTON, K.R. BROWN, R.J. EPSTEIN¹, J.P. HOME, J.D. JOST, E. KNILL, C. LANGER², D. LEIBFRIED, C. OSPELKAUS, R. OZERI³, S. SEIDELIN⁴, A. VANDEVENDER, J.H. WESENBERG⁵, D.J. WINELAND — Scaling up traps to control numerous atomic ions is an important step towards large-scale trapped-ion quantum information processing, and likely will require two-dimensional junctions such as T-(#) or X-intersections. An 18-zone ion trap array that incorporates such an X-intersection has been demonstrated. One issue that impedes travel through this structure is the RF pseudopotential bumps that occur at the junction. With the use of 9Be^+ and 24Mg^+ ions, we explore the movement of ions through this junction while maintaining reasonable trapping frequencies and minimizing motional excitation. Current experiments are devoted to exploring the tradeoffs between transport duration and ion heating. (Work supported by IARPA.) (#)W. K. Hensinger, et al; **App. Phys. Lett.** 88, 034101 (2006).

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