

Abstract Submitted  
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**Nonlinear dynamics in a surface-electrode multipole ion trap<sup>1</sup>**

ROBERT CLARK, MARK MAURICE, DYLAN GREEN, The Citadel — The surface electrode multipole ion trap (Appl. Phys. B **113** 171 (2013)) allows one to realize a highly symmetric, yet anharmonic, confining potential for a single charged particle. We present a detailed model of such a trap, and measurements demonstrating the nonlinear character of the trap through the observation of frequency upconversion in the (classical) motion of a single trapped sugar particle. We will discuss extending these measurements to atomic-scale systems, as well as possible applications to mass spectrometry, quantum chaos, and quantum information science.

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