Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Rotating-radio-frequency ion traps. T. HASEGAWA, Dept. Phys., Keio Univ., Kanagawa 223-8522, Japan, J.J. BOLLINGER, NIST, Boulder, CO 80305 — We discuss a new ion trap, the rotating-radio-frequency (rotating-rf) trap, in which the motion of a charged particle is described by trigonometric functions rather than the usual Mathieu functions of a normal rf trap.[1,2] In the rotating-rf trap, a rotating quadrupole electric field confines charged particles, whereas in a normal rf trap, an oscillating quadrupole electric field does. Ion motion in a rotating-rf trap is a superposition of two non-degenerate circular secular motions and two corresponding circular micromotions. The cases of applying a uniform dc magnetic field and a quadrupole dc electric field in addition to the rotating rf field are also discussed. Confinement in a rotating-rf trap can be tighter than in a normal linear rf trap with the same experimental parameter values.

[1]R.I. Thompson, et al., Can. J. Phys. **80**, 1433 (2002).
[2]T. Hasegawa et al., Phys. Rev. A **72**, 043403 (2005).

John Bollinger
NIST, 325 Broadway, Boulder, CO

Date submitted: 03 Feb 2007 Electronic form version 1.4