

MERCURY-ION CLOCK BASED ON LINEAR MULTI-POLE ION TRAP

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Abstract:

Buffer gas cooled clocks rely on large number of ions, typically $\sim 10^7$, optically pumped by a discharge lamp at scattering rates of a few photons per second per ion. To reduce the 2nd Doppler shift from space charge repulsion of ions from trap node line, novel multi-pole ion traps are now being developed where ions are weakly bound with confining fields that are effectively zero through the trap interior and grow rapidly near the trap electrode "walls."