

Electrostatic Traps as a High Precision Measurement Tool

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Using principles analogous to those of conventional optics it is possible to construct fully electrostatic ion traps which act as a resonant cavity for ion beams. Such traps exhibit an unexpected phenomenon of self-bunching which allows for long lifetimes of trapped ion bunches.

I will present the principles and design of one such electrostatic trap, originally designed at the Weizmann Institute and now being constructed and installed at LBL. I will further discuss the experimental possibilities afforded by such a trap, with emphasis on mass spectroscopy and possible measurements of β decay correlations of trapped radioactive ions. Such measurements allow the study of possible standard model extensions affecting the structure of the weak interaction.