

## Study of cylindrical ion trap with new periodic impulsional potential form

### ABSTRACT

The paper reports on some theoretical studies carried out on a cylindrical ion trap (CIT) supplied with a new periodic radio frequency impulsional potential of the form  $V \cos \Omega t [1 + k \cos^2 \Omega t]^{1-k}$  with  $0 \leq k < 1$  ( $[\ ]$  means floor function). The performance characteristics of the cylindrical ion trap impulsional mode, for the two stability regions, were computed using fifth order Runge-Kutta method and compared to the classical sinusoidal mode  $k=0$ . The physical properties of the confined ions in the  $r$  and  $z$  axes are illustrated.

**Keyword:** Cylindrical ion trap; Impulsional potential; Fifth order Runge-Kutta method; Stability regions; Ion trajectory