

QUANTUM OPTICS SEMINAR



Title: Ion distribution in radiofrequency traps and the effects of the DC-electrodes in the anharmonics terms of the RF field

Speaker: Jofre Pedregosa
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Time: Thursday, June 4 at 10:15

Place: Phys.Aud.

Abstract:

Radiofrequency traps are a useful experimental approach to investigate a large spectra of fundamental physics. In particular they allow the study of Coulomb crystals, where an ensemble of trapped ions organize themselves in shell-like structures. Generally, the trap of choice to obtain crystallization is a linear quadrupole trap. However, very little work in this area has been done with higher order traps, such as octopoles, where dynamics are governed by a different potential shape. In order to learn about the ion distribution in multipole traps, I will present a method, originally developed for particles in Penning trap, that model the trapped ion cloud as a cold fluid, which is applicable to any type of linear RF trap, allowing to scale the size of large samples with the trapping parameters and the number of trapped ions, for different linear dimensions of the trap. I will also introduce a detailed study of the anharmonics components in the radiofrequency field as a function of different possible implementations of linear quadrupole traps. Anharmonics terms play an important role in the process known as 'RF-heating', main responsible of the lost of ions from this type of traps. It will be shown how the geometry of the DC-electrodes drastically affects these terms.

Aurelien Dantan

Coffee, tea and bread rolls will be served at 10.00