



Estimation of RF heating and cooling rates of an electron-positron plasma confined in a Combined Trap

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Abstract

The cross-sections have been estimated for heating of confined electrons and positrons due to two type of RF driven collisions, (a) elastic collisions between electrons/positrons and the background gas molecules (σ_n) (b) Coulomb collisions between electrons and positrons (σ_{ep}), in an electron-positron plasma confined in a RF quadrupole combined trap. Confinement is expected to improve if rate of cooling by cyclotron cooling mechanism as well as by inelastic collisions with CO_2 matches with the rate of heating. For this purpose, buffer gas assisted cooling rate at appropriate pressure as well as the required axial magnetic field have also been estimated in an extension of the case study that had been initiated earlier [1].

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