Abstract Submitted for the DAMOP15 Meeting of The American Physical Society

Role of inelastic collisions in explanation of the effect of rotating wall trap of electrons/positrons in gases ZORAN PETROVIC, SRDJAN MARJANOVIC, Institute of Physics, University of Belgrade 11080 Zemun — The only existing explanation of the rotating wall positron trap operating in the low space charge limit (swarm) [ref] is based on momentum transfer collisions to represent the collisions of positrons in gas and to facilitate the effective narrowing of the profile and heating/cooling succession. The collisions are represented through a viscous term of a simple transport equation. In that model effective viscosity term is used to fit the observed data with no attention paid to the magnitude of the term compared to the measured or theoretically predicted values. We apply a well tested Monte Carlo technique whereby all interactions may be described by exact experimental or theoretical cross sections. We separate effects due to inelastic processes with small and large energy losses (i.e. on vibrational or rotational excitation versus electronic excitation). It turns out that large energy loss processes are essential in narrowing the profile but also that low energy loss processes define thermalization to the room temperature or lower and allow cooling of the ensemble. Heating was necessary to allow narrowing of the profile but the particles have to return to the thermal equilibrium with low fields.

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Date submitted: 31 Jan 2015

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