Abstract Submitted
for the GEC13 Meeting of
The American Physical Society

Monte Carlo simulation of rotating wall positron cloud compression[1] SRDJAN MARJANOVIC, ANA BANKOVIC, MILOVAN SUVAKOV, SASA DUJKO, ZORAN LJ. PETROVIC, Institute of Physics, Pregrevica 118, 11080 Belgrade, Serbia — We have used our standard Monte Carlo code and applied it to electric potential setup that models the conditions inside the rotating wall apparatus. This model has allowed us to investigate the mechanisms behind the compression and to determine the types of collisions responsible for compression. Our results show that both "high threshold" losses, like ionization or electronic excitation, as well as "low threshold" losses, like vibrational and rotational excitations, play a role in compression. Parts of the positron ensemble that are further away from the axis are heated by the rotating field much stronger than the particles that are closer. Without the "high threshold" processes trajectories of these particles become unstable after several collisions. On the other hand, these "high threshold" processes do not provide strong enough cooling for fast compression. That is why "low threshold" processes are necessary to compress the positron beam to widths several orders of magnitude smaller. In addition we will report on frequency scan for compression rates, as well as compression rates for different values of the applied rotating electric field, magnetic field, and background gas pressure conditions.

[1]This work was supported by the MNTR, Serbia, under Contracts ON171037 and III41011.

Srdjan Marjanovic
Institute of Physics, Pregrevica 118, 11080 Belgrade, Serbia

Date submitted: 14 Jun 2013 Electronic form version 1.4