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Monte Carlo modeling of Surko type positron traps MILOVAN SUVAKOV, SRDJAN MARJANOVIC, ANA BANKOVIC, ZORAN PETROVIC, Institute of Physics Belgrade Serbia, STEPHEN BUCKMAN, CAMS ANU Canberra Australia, JOAN MARLER, Northwestern University IL Evanston USA —
Using comprehensive cross section sets for e^+ - N_2 and e^+ - CF_4 interaction and a Monte Carlo code, we have modeled several configurations of collisional Penning-Mamberg-Surko positron trap. The static models include three stage potential well configuration. The dynamic model employs a time dependant electric potential that corresponds to the loading, cooling and dumping stages of the trap operation. We analyzed the type and frequency of collisions in different parts of the trap and mechanisms of positron losses. The results include overall trapping efficiency and the parameters of the outgoing beam such as positron energy distribution and the width of the beam. The goal of the simulation is to optimize the parameters of the trap (buffer gas pressures, dimensions of the chamber, electric potential shape, duration of different operation stages, etc.). In addition we can include realistic magnetic field and gas density distributions and investigate how those affect the performance of the trap.

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