

Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

The influence of anisotropic scattering of positrons on transport coefficients ANA BANKOVIC, SASA DUJKO, ZORAN PETROVIC, Institute of Physics, Belgrade, Serbia, STEPHEN BUCKMAN, Centre for Antimatter-Matter Studies, Australian National University, Canberra Australia, RONALD WHITE, Centre for Antimatter-Matter Studies, James Cook University, Townsville, Australia — Positron Emission Tomography is widely used technique for general diagnostics of metabolic activity and for the identification of cancerous tumors. The fundamental interactions of positrons with atoms and molecules in the human body are not well understood and quantified. Modeling of damage induced by positrons traversing the living tissue (usually modeled as water) is not an easy task and almost every existing model in medicine is based on semi empirical data. In this work, positron transport is investigated in water vapour using isotropic and anisotropic scattering models, based on fundamental collisional data obtained in either beam experiments or by theoretical calculations. The latter model is particularly important since the water molecule is highly polar. Benchmark calculations are performed using a Monte Carlo simulation technique. Similar very strong effects of positronium formation are observed as in argon. Several transport coefficients has been determined for a wide range of E/N which may be used as a benchmark for testing of codes aimed at modeling of positron diagnostics and therapy.

Zoran Petrovic
Institute of Physics, Belgrade, Serbia

Date submitted: 06 Feb 2011

Electronic form version 1.4