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On thermalization of positrons in water vapour SRDJAN MARJANOVIC, ANA BANKOVIC, Institute of Physics Belgrade, University of Belgrade, Serbia, STEPHEN BUCKMAN, Centre for Antimatter-Matter Studies, Australian National University, Canberra, ACT, GUSTAVO GARCIA, Instituto de Física Fundamental, Consejo Superior de Investigaciones Científicas, Madrid, Spain, RONALD WHITE, Centre for Antimatter-Matter Studies, James Cook University, Townsville, Australia, MICHAEL BRUNGER, Physics Department, Flinders University of South Australia, Adelaide, South Australia, MILOVAN SUVAKOV, GORDANA MALOVIC, SASA DUJKO, ZORAN LJ. PETROVIC, Institute of Physics Belgrade, University of Belgrade, Serbia — Water being the main component of the human tissue is the primary candidate for the basis of models describing positron diagnostics and therapy. Our calculations are based on the elementary binary cross sections measured or calculated. We use a Monte Carlo code following all individual collisions and trajectories allowing for the addition of external fields and accurate representation of non-conservative processes. In order to obtain realistic results completeness should be achieved for energy, momentum and number balances. Rather than determining transport coefficients which have only been measured in few cases for positrons we determine other observables. We determine the thermalization of a group of positrons released at a point in water vapour. The thermalization times may be scaled using Nt scaling. We also calculate the range of positrons, the corresponding diffusion coefficient and show shapes of individual trajectories. Finally we also establish the energy loss spectrum on the basis of binary processes. This allows us comparisons with other codes used to model transport of positrons.

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