

Abstract Submitted  
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**Modelling Positron Interactions with Matter**<sup>1</sup> G. GARCIA, CSIC, Madrid, Spain, Z. PETROVIC, Institute of Physics, Belgrade, Serbia, R. WHITE, CAMS, James Cook University, Australia, S. BUCKMAN, CAMS, Australian National University, Canberra — In this work we link fundamental measurements of positron interactions with biomolecules, with the development of computer codes for positron transport and track structure calculations. We model positron transport in a medium from a knowledge of the fundamental scattering cross section for the atoms and molecules comprising the medium, combined with a transport analysis based on statistical mechanics and Monte-Carlo techniques. The accurate knowledge of the scattering is most important at low energies, a few tens of electron volts or less. The ultimate goal of this work is to do this in soft condensed matter, with a view to ultimately developing a dosimetry model for Positron Emission Tomography (PET). The high-energy positrons first emitted by a radionuclide in PET may well be described by standard formulas for energy loss of charged particles in matter, but it is incorrect to extrapolate these formulas to low energies. Likewise, using electron cross-sections to model positron transport at these low energies has been shown to be in serious error due to the effects of positronium formation.

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