Simulating positron to positronium conversion in nanostructured materials

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Silicon-based nanochanneled converters (NCPs) for the production of cold Positronium (Ps) have been introduced in 2010 [1,2,3] and since then provided a reliable source of cold Ps to a variety of experiments [4,5,6,7,8].
With the goal of advancing the optimization of such converters we have formulated a classical model to describe the production and cooling of Ps in NCPs [9,10]. The simulation of such process poses several challenges due to the complexity of the geometry in which it takes place. We will here briefly present our model and discuss several simplifications of the simulation process which, without altering significantly the simulation results, reduce the computational costs enough to allow for systematic scans of the NCP construction parameter space.

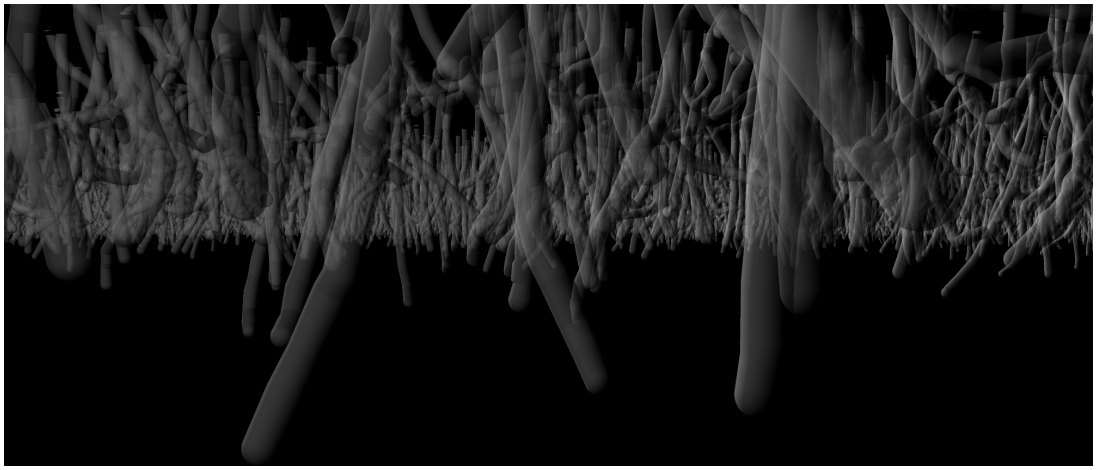

Figure 1 3D rendering of *a geometric model of the nanoscopic channels in an NCP converter*

References

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