

# A study on the spatial resolution of human RPC-PET

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The Resistive Plate Chamber (RPC) concept for time of flight positron emission tomography (RPC-PET) is based on the converter-plate gamma detection principle and takes advantage of the naturally layered structure of RPCs, of its simple and economic construction, excellent time resolution and very good intrinsic position accuracy. These characteristics may be of interest for the detailed imaging of small animals and for high-sensitivity whole-body human TOF PET.

In this work we address the spatial resolution characteristics of a hypothetical full-body RPC-PET system by simulations performed in GEANT4. Several parameters affecting the spatial resolution are accessed: positron range, photon pair non-collinearity, scatter in the detector, parallax errors introduced by the electrons in the gas gap, depth of interaction and detector readout granularity.

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