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(54) Title: A TOF-PET TOMOGRAPH AND A METHOD OF IMAGING USING A TOF-PET TOMOGRAPH, BASED ON A PROBABILITY OF PRODUCTION AND LIFETIME OF A POSITRONIUM

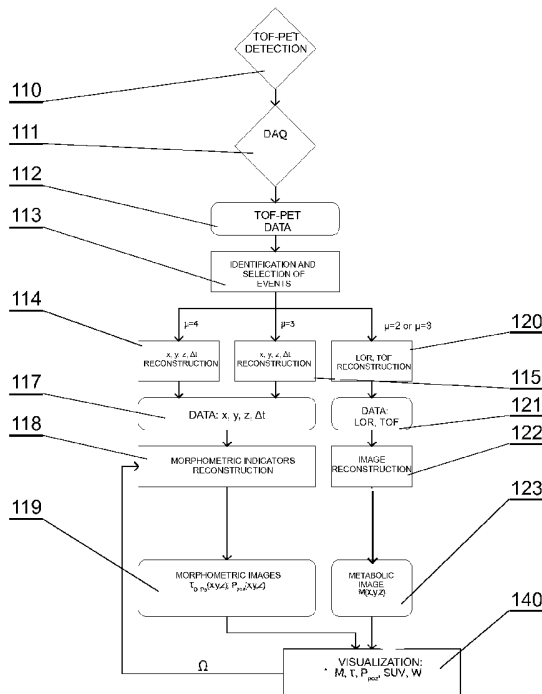


Fig. 1

(57) Abstract: A tomograph for imaging an interior of an examined object, the tomograph comprising: TOF-PET detection modules configured to register annihilation quanta and deexcitation quanta and a data reconstruction system (103, 203, 303) configured to reconstruct an ortho-positronium $t_{o,p_s}(x,y,z)$ lifetime image and a probability of production of positronium $P_{pos}(x,y,z)$ as a function of position in the imaged object, on the basis of a difference (Δt) between a time of annihilation (t_a) and a time of emission of a deexcitation quantum (t_e), wherein the TOF-PET detection modules (101, 201, 301) comprise scintillators having a time resolution of less than 100 ps.

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