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Precise Timing - the route to better PET images

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PET imaging relies on the detection of two back-to-back 511 keV gamma photons. A line is constructed connecting the detection points of these two gamma (known as the line of reaction (LOR)). The image is constructed by analysing all these lines. If the time-of-arrival of the two gamma photons is precisely measured, this line is shortened to be just a line segment, with more precise timing resulting in a shorter line segment. These short line segments allow much speedier image reconstruction and reduce the background images. This presentation will focus on the techniques used to precisely measure the position and time of the photoelectric interaction and the requirements of the timing system.

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