

Perspective for a Total Body PET with ≤ 100 ps timing resolution

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The quest for pushing the limits of PET's effective sensitivity has led to two important R&D lines, illustrated by the remarkable development of the Total Body PET Explorer project and the 10 ps Time-of-Flight PET challenge.

But there is no reason why these two approaches cannot be combined, along a route already open by the Siemens Biograph Vision Quadra machine, with a length of 106cm and a quoted CTR resolution of 228ps at the peak of the NEC sensitivity.

This talk will show how recent progress in the development of metascintillators, combining the high stopping power of well know scintillators with the sub ns emission of cross-luminescent scintillators, or the ultrafast photon emission resulting from the 1D, 2D, or 3D quantum confinement of the excitons in nanocrystals, open interesting perspectives for the development of a Total Body PET with ≤ 100 ps timing resolution.

A trade-off between the axial length and the timing resolution of the PET scanner could result in an attractive cost compromise for routine clinical applications.

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